



Education Department, UT Chandigarh

Critical and Creative Thinking

Mathematics Practice Booklet
Class: 9



राज्य शैक्षिक अनुसंधान और प्रशिक्षण परिषद्
STATE COUNCIL OF EDUCATIONAL RESEARCH AND TRAINING
SECTOR-32 UT CHANDIGARH



Websites/links to download CCT Resource Material

CCT Tracker:

- URL: <https://pisa.diksha.gov.in>
- User Id: utcschools
- Password: Utcschools@01

SE Shagun Portal:

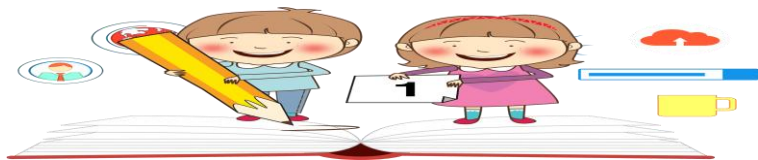
- <http://pisa.seshagun.gov.in/codes.html>
- <http://pisa.seshagun.gov.in/?AspxAutoDetectCookieSupport=1>
- <http://pisa.seshagun.gov.in/cct/>

DIKSHA:

- <http://diksha.gov.in>
- QR code and link for CCT Weekly- R5Z7P5
- <https://diksha.gov.in/get/dial/R5Z7P5>

OECD – PISA:

- <https://www.oecd.org/pisa/>
- <https://www.oecd.org/pisa/publications/>

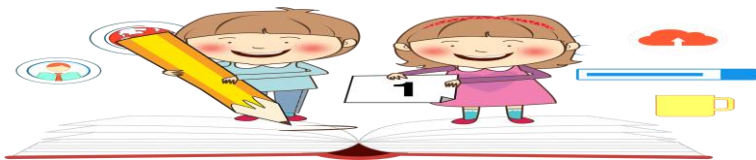


Challenge
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NCERT: CLASS 9 CURRICULUM

Chapter No. & Name	Experiential learning*	CCT Literacy Area	Learning Outcomes	Integration with other subjects *
1. Number Systems	<p>To calculate interest rate on a saving account in a bank, calculate maximum and minimum weight, quantity and time etc.</p> <p>Visit to a bank to understand different banking transactions, gymnasium to find weight gained or lost.*</p>	Quantity	The learner applies logical reasoning in classifying real numbers, proving their properties and using them in different situations.	Punjabi – Write a formal letter to the bank manager to grant permission to visit the bank*
2. Polynomials	<p>Dividing pizza into equal pieces, exchanging money, comparing prices, planning vacation trip. Garden, comparison of ages, board games. Number patterns To apply in business & finance management, sports, cooking, etc.</p> <p>Visit to a hotel management institute, business house.*</p> <p>Visit to a Grocery store etc..*</p>	Change & Relationship	The learner applies logical reasoning in classifying real numbers, proving their properties and using them in different situations.	Business Studies – Visit a stock exchange or currency exchange shop.*
3. Coordinate Geometry	<p>Finding coordinates of different points in a region</p> <p>Visit to a tourist spot and assessing the map of the region for the location of a point in that area*</p>	Change & Relationship	<p>The learner develops strategies to locate points in a Cartesian plane.</p> <p>The learner derives formulae to establish relations for geometrical shapes in the context of a coordinate plane, such as finding the distance between two given points, to determine coordinates of a point between any two given points etc.</p>	<p>Social Studies – Study the map of the city beautiful.*</p> <p>Science – Calculate distance using speed, distance and time formula*</p>



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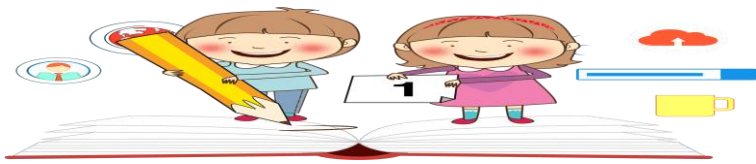
4. Linear Equations in Two Variables	<p>Library, stationery shops, hostel mess, baker's shop, grocery shop, vegetable market, examination, age related problems, tree plantation, etc.</p> <p>Visit to a market, library, hostel mess, or being part of vanmohatsav drives etc.*</p>	Change & Relationship	<p>The learner relates the algebraic and graphical representations of a linear equation in one/two variables and applies the concepts to daily life situations.</p>	<p>English – Write a poem on baker's shop, make an advertisement for tree plantation drive*</p> <p>Art – Draw a poster on tree plantation drive*</p>
6. Lines and Angles	<p>Types of angles, figures in swings of amusement park, study of the map of city beautiful, any road map, metro map etc.*</p> <p>Visit to an amusement park, trip of, bridges, lakes to observe sail boats etc.*.</p>	Shape & Space	<p>The learner classifies pairs of angles based on their properties as linear, supplementary, complementary, adjacent and vertically opposite and finds value of the one when the other is given.</p> <p>The learner verifies the properties of various pairs of angles formed when a transversal cuts two lines.</p>	<p>Social Studies– In the atlas students are made to find parallel lines, perpendicular lines found on the map.*</p> <p>Art – Drawing an amusement park scene with understanding of different shapes of the swings in the park.*</p>
7. Triangles	<p>Decoration pieces, board games for children, placing of ladders along the walls, making triangular traffic signals.</p> <p>Visit to a traffic park to observe traffic signs, roofs of houses etc.*</p>	Shape & Space	<p>The learner explains congruency of triangles on the basis of the information given about them like (SSS, SAS, ASA, RHS)</p> <p>The learner works out ways to differentiate between congruent and similar figures.</p>	Art and Craft – To draw or build a model of a 3-D figure of a pyramid using triangles etc*.
8. Quadrilaterals	<p>Making different toys with different shape objects in a toy making competition in school, Construction work, symmetrical figures, bulletin boards in school, hoardings on roadsides, road signs etc.</p> <p>Visit to a toy shop, construction site, buildings, monuments etc.*</p>	Change & Relationship	<p>The learner differentiates between different types of quadrilaterals like parallelogram, square, rectangle etc.</p> <p>The learner applies the properties of quadrilaterals.)</p>	English – A conversation between 2 toys describing the different shapes they are made from.*



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9. Areas of Parallelograms and Triangles	<p>In a herbal garden of the school growing of plants in different parts of the field, Used in construction of buildings, printing industry, interior designing</p> <p>(False ceiling), furniture designing and architecture.</p> <p>Visit to an herbal garden of your school or locality, printing/ furniture factory and construction sites.*</p>	Change & Relationship	The learner relates the areas of two parallelogram, triangle and parallelogram etc	<p>Art – Using the concept of parallelograms and the areas to draw a field and divide it into given number of equal parts for growing herbal plants and also labelling the plants with labels of different shapes*.</p>
10. Circles	<p>Bakery shop for sizes of cakes and pizza, watching IPL match in Mohali Cricket Stadium, Circumference of wheels and alloys.*</p> <p>Visit to the Mohali Cricket Stadium, an auto wheel factory, Restaurants, roundabouts etc.*</p>	Shape & Space	The learner understands the different parts of a circle, angles in a same segment, cyclic quadrilaterals etc.	<p>Hindi – Writing a letter to a friend describing your visit to the Mohali Cricket Stadium.*</p> <p>Social Studies- Study of the history of the wheel.*</p>
12. Heron's Formula	<p>Eating nachos, staircase and ladder, roofs of houses*</p> <p>Celebrating a birthday with nachos, visit to buildings and monuments*</p>	Shape & Space	The learner finds area of triangles using all types of appropriate formulas.	<p>Home Science – Making nachos and salsa sauce*</p>
13. Surface Areas and Volumes	<p>Construction of swimming pool in school, construction of school auditorium, playing fields, etc.*</p> <p>Finding volume of cylindrical, conical objects.*</p> <p>Visit to an auditorium and swimming pools, temples, monuments, construction sites</p>	Shape & Space	The learner derives formulas for surface areas and volumes of different solid objects like, cubes, cuboids, right circular cylinders/ cones, spheres and hemispheres and applies them to objects found in the surroundings.	<p>Sports – Learning swimming in the school/local swimming pool.*</p> <p>Value Education – Arranging a fete for the school alumni in the school to collect funds for the construction of the school auditorium*</p>

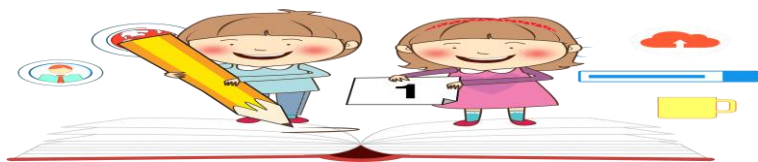


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	etc.*			
14. Statistics	<p>Medical study, scores of players, population study and weather pattern*</p> <p>Visit to the metrological department, a hospital, cricket or football match etc.*</p>	Uncertainty & Data	<p>The learner identifies and classifies the daily life situations in which mean, median and mode can be used.</p> <p>The learner analyses data by representing it in different forms like, tabular form (grouped or ungrouped), bar graph, histogram (with equal and varying width and length), and frequency polygon</p>	<p>Social Studies – Visit the meteorological department to study about weather predictions*</p>
15. Probability	<p>Weather forecast department to study rainfall, snowfall, Temperature variation, cricket scores, report cards, marks obtained, average hours of sunshine, weather report, climate change, elections, dice games,*</p>	Uncertainty & Data	<p>The learner calculates empirical probability through experiments.</p>	<p>Hindi – Skit on how gambling can have ill effects on the society*</p>

**These activities are only suggestive activities, other activities can be further conducted as per need of the topic.*

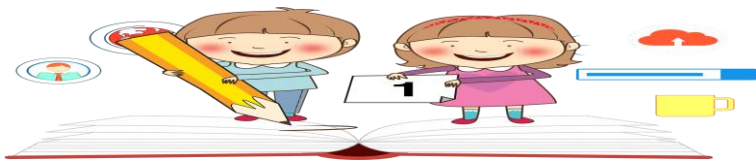


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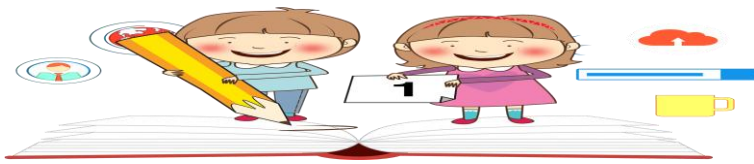
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FITNESS CHALLENGE

30 DAYS:30MINUTES

FITNESS challenge

month of: SEPTEMBER

DIRECTIONS: list a 30-minute fitness goal for each day, when completed put a check-mark in the circle

DAY 1 <u>9490</u>	●	DAY 16 _____	●
DAY 2 <u>9430</u>	●	DAY 17 _____	●
DAY 3 <u>6264</u>	●	DAY 18 _____	●
DAY 4 <u>8961</u>	●	DAY 19 _____	●
DAY 5 <u>11435</u>	●	DAY 20 _____	●
DAY 6 <u>4538</u>	●	DAY 21 _____	●
DAY 7 _____	●	DAY 22 _____	●
DAY 8 _____	●	DAY 23 _____	●
DAY 9 _____	●	DAY 24 _____	●
DAY 10 _____	●	DAY 25 _____	●
DAY 11 _____	●	DAY 26 _____	●
DAY 12 _____	●	DAY 27 _____	●
DAY 13 _____	●	DAY 28 _____	●
DAY 14 _____	●	DAY 29 _____	●
DAY 15 _____	●	DAY 30 _____	●

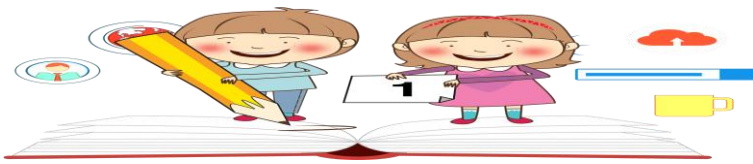
Rahul has started with the 30-day: 30 min daily walking challenge. He goes for a walk daily, counts the steps and notes them in a diary. One of his diary pages as shown above shows the record of a week in the month of September. His daily target is 9000 steps.

1) Circle on the calendar, how many days did he achieved the target?



2) Approximate and round off the steps to nearest 100, what were the maximum and minimum values among the approximations?

- (a) Max value = 11400, Min value = 4500 ☐
- (b) Max value = 12000, Min value = 3500 ☐
- (c) Max value = 10500, Min value = 4000 ☐
- (d) Max value = 11500, Min value = 4700 ☐



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PIZZA PIE

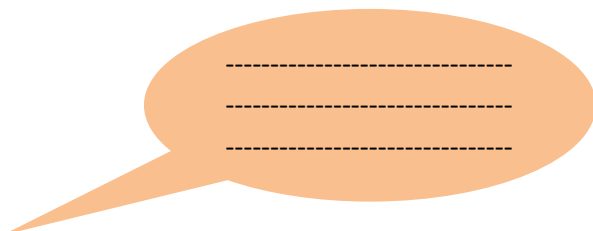
- 1) A man is fond of eating pizzas. On Sundays every time he is hungry, he wants at least a slice of pizza to eat. During the first meal he eats the half of the pizza. In the second meal, he eats the $\frac{1}{3}$ of the remaining part of the pizza. The third time he eats $\frac{1}{4}$ of what is left with tea and Fourth time in dinner he eats $\frac{1}{5}$ of what still remains. He then stops because the last piece he wants to share with his pet Bruno. What fraction of original pizza does Bruno get?

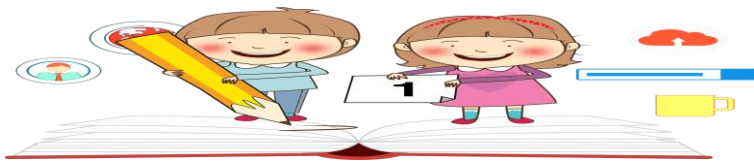


Tick the correct option:

- (a) 0.25 ☐
 (b) $\frac{1234}{2345}$ ☐
 (c) 0.12345 ☐
 (d) $\frac{1}{5}$ ☐

- 2) In office the man decides to share his large sized 14-inch Domino's pizza with his nine friends equally (as shown in figure). Approximately at what length of boundary of pizza should he make cuts so that each friend gets equal slice of Pizza?





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CORONA VIRUS PREVENTION:

Make hand sanitizer at home using these three ingredients

By -

TIMESOFINDIA.COM

Updated: Mar 25, 2020, 19:59 IST

After the spike of positive cases of corona virus in the capital, everyone is in panic mode. While people are trying to stock masks and hand sanitizers, many pharmacies are already out of stock. What if we told you, you can make an equally effective hand sanitizer at home? To prepare it, you just need some basic ingredients that you can easily find at the drug store or a grocery store.



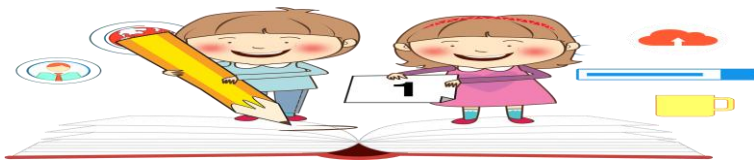
According to the Centre for Disease Control and Prevention, we should use a sanitizer with at least 60 per cent alcohol content in it. This recipe is for a sanitizer with the alcohol content which is more than 60 per cent.

What you will need:

- $\frac{2}{3}$ cup of isopropyl alcohol
- $\frac{1}{3}$ cup of aloe vera gel (If you want to increase the alcohol content in the sanitizer, you can reduce the aloe-vera gel to $\frac{1}{4}$ cup).
- Essential oil of your choice
- A medium-size mixing bowl
- A spoon
- An empty container to store the sanitizer

How to make the sanitizer at home?

- Take the mixing bowl and add Isopropyl alcohol and aloe vera gel in the given quantities.
- Mix them until well blended.
- Now add eight-10 drops of essential oil to the mixture to make it smell nice.
- Now pour this homemade sanitizer into an empty container and close it properly. You can take a small piece of masking tape and



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label the bottle as hand sanitizer to leave no confusion for anyone who sees the bottle.

Though yes, washing hands with soap and water for at least 20 seconds is the best way to safeguard you, using sanitizer is definitely the second-best option.

Germoff is a pharmaceutical company which manufactures alcohol-based sanitizers. With the onset of Covid-19, the company sales shot up drastically as the demand increased in hospitals as well as for general public. Answer the questions based on the data given below.

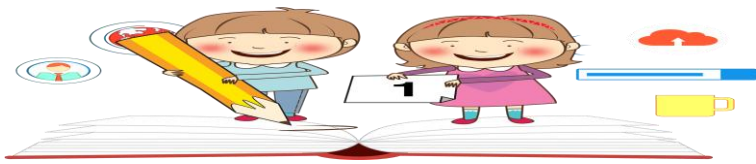
- 1) The cost price of a 250ml bottle of sanitizer is ₹ 25, while the sale price is ₹ 100. With Covid-19, as the demand was much higher than the supply, the cost of the sanitizer in the market shot up and people had to pay 1.5 times the regular selling price. Calculate the percentage increase in profit margin per bottle of sanitizer.



- 2) With the Government ordering sanitizers in bulk, Germoff decided to give a discount of 25% on its current sale price. What is the difference in profit percentages between bottles of sanitizer sold to average customer vs the government?



- 3) With the sales of sanitizers increasing and other companies interested in increasing their market share, by selling their sanitizers at lower prices, Germoff had to cut down on its profit margins by giving discount on their sale price to the customers. With a 15% discount per bottle, by how much did the profit margin of the company per bottle of sanitizer sold fall?

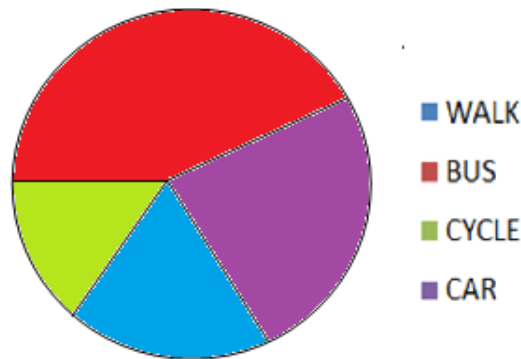


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SCHOOL SURVEY

Every school takes various safety measures for the students. The principal instructs the teachers to make a chart of mode of transportation in each of their respective class. The teacher asks the monitor do the survey and make the chart of 40 students of class9. He found 7 students walk to school, $\frac{2}{5}$ thrives the bus, and 30% are dropped by the parents and the rest come by cycle. He prepared the following chart.



- 1) By which mode of transportation maximum numbers of students come to school?

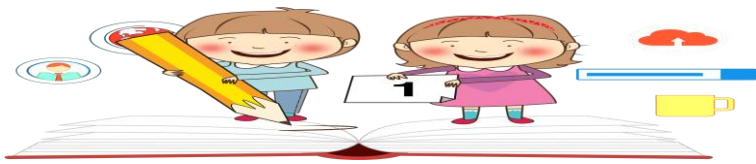


- 2) Calculate the number of students who come to school by cycle



- 3) If the students who come by bus are lined up 10 minutes before the school bell rings to avoid rush on exit, then how many students are still left sitting in the class.





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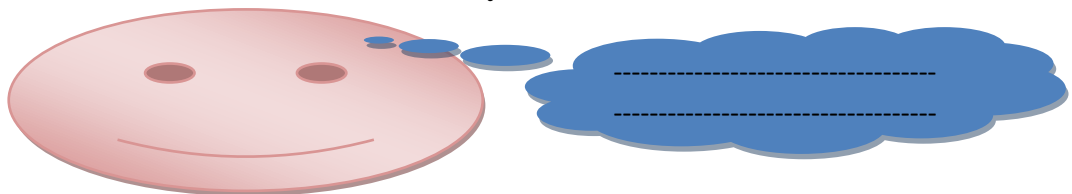
BIRTH RATE



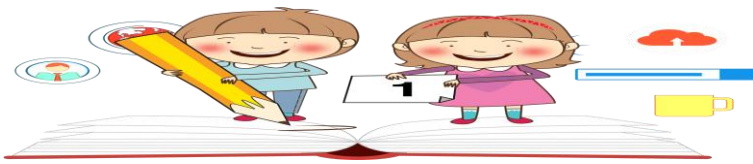
Birth rate represents the child birth per thousand people each year. Statisticians use the birth rate to study the cause of decline or population growth around the World.

$$\text{Birth rate} = \left(\frac{\text{no. of births in a year}}{\text{total population in the mid-year}} \right) \times 1000$$

- 1) If in 2007 there were 3250 births in a city with population of 223000, then what was the birth rate of the city?



- 2) A report said that for every 100 babies born in a country, there were 12 more girls than boys. What is the highest expected number of girls in a class of 25 children?
- (a) 15
 - (b) 13
 - (c) 12
 - (d) 14



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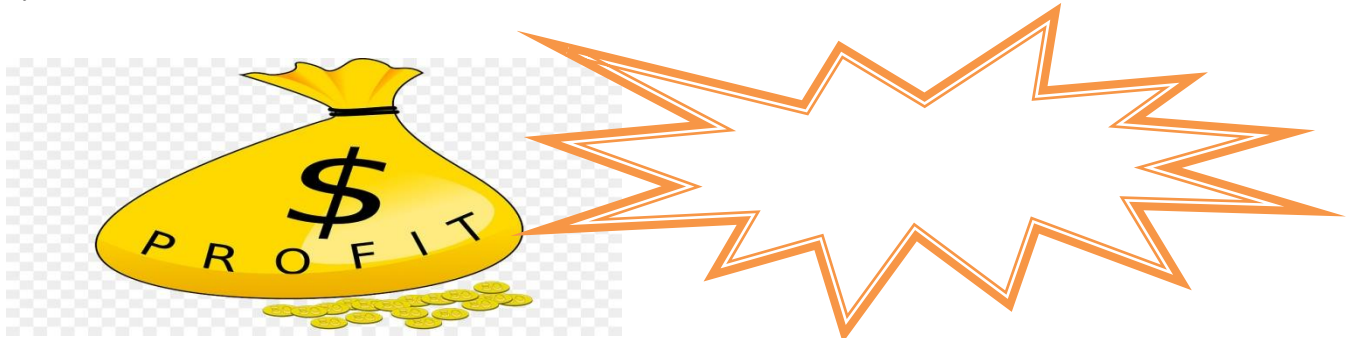


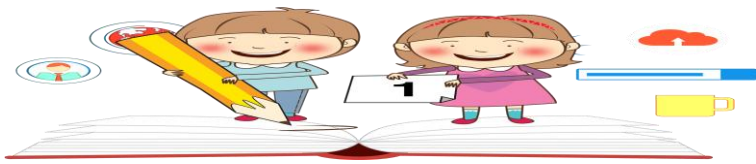
BAKER'S SHOP

Yusuf Mohammed wins a lottery ticket. He was interviewed and asked about how he shall be spending the money. Yusuf was determined to open a bakery shop with this earned money and to improve his family living. He left no stone unturned to fulfill his dream.



- 1) If Yusuf spends ₹ 10,000 as initial startup cost and then earns ₹ 5000 per month in sales. Choose the correct relationship between money earned (E) and months (M) he worked for?
 - (a) $E = 5,000 M - 10,000$
 - (b) $E = 5,000 M + 10,000$
 - (c) $M = 5,000\% M + 10,000$
- 2) How much will he earn in 6 months?

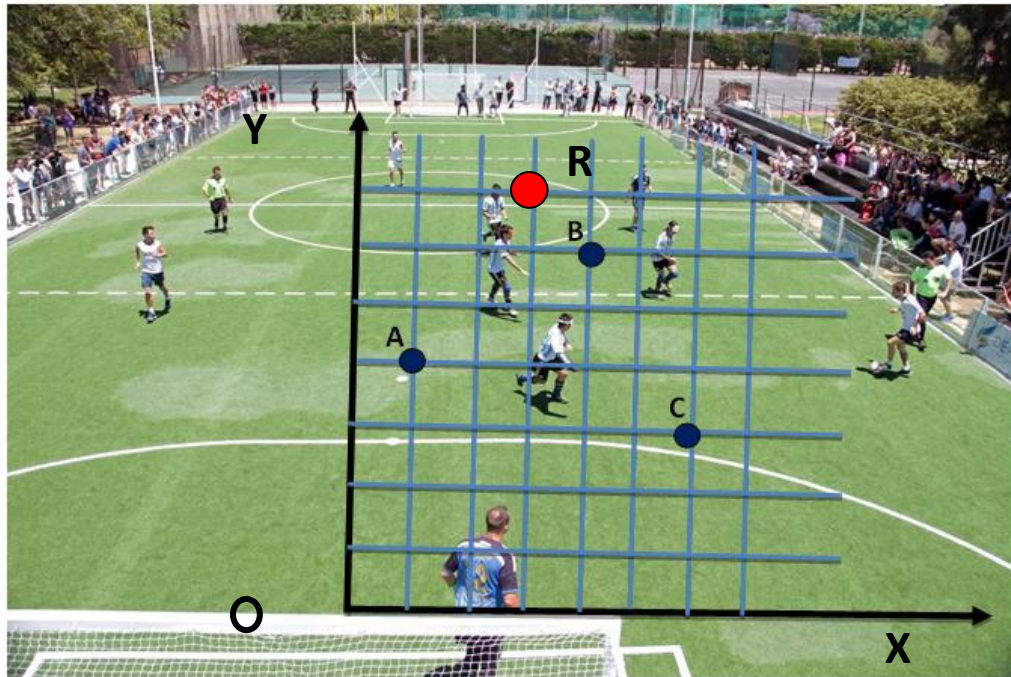




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FOOTBALL FIELD

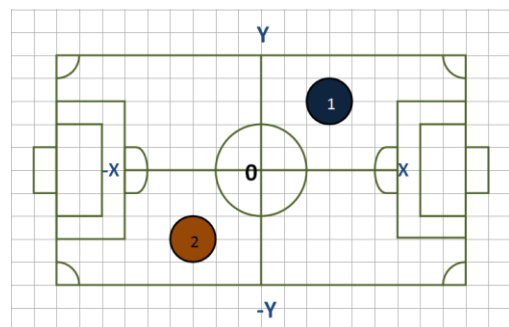


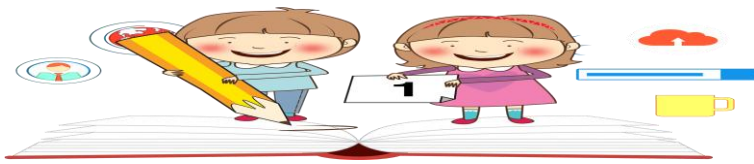
Four players are playing football in the field. The positions of three players A, B, C is located on the graph as shown in the figure.

- 1) Where should the 4th player D stand so that the square ABCD can be formed?
 - (a) D(3,2)
 - (b) D(4,2)
 - (c) D(4,1)
 - (d) D(3,1)
- 2) If referee is standing at position R as shown in the figure, what is the ordinate of the position of the referee?

- 3) If shape 1 and 2 in the adjoining figure represent footballs then which football is near to the origin?

- (a) No idea
- (b) Football 1
- (c) Football 2
- (d) Both are at same distance



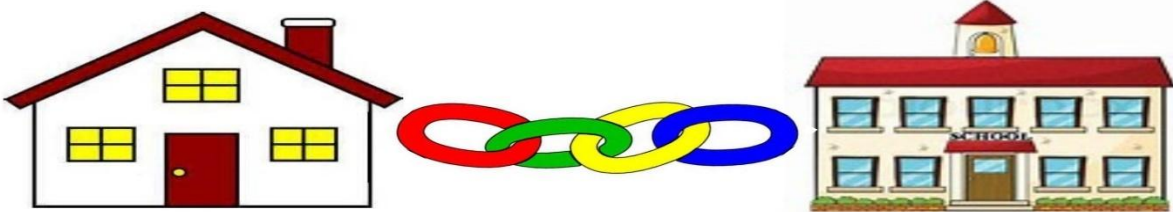


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DISTANCE

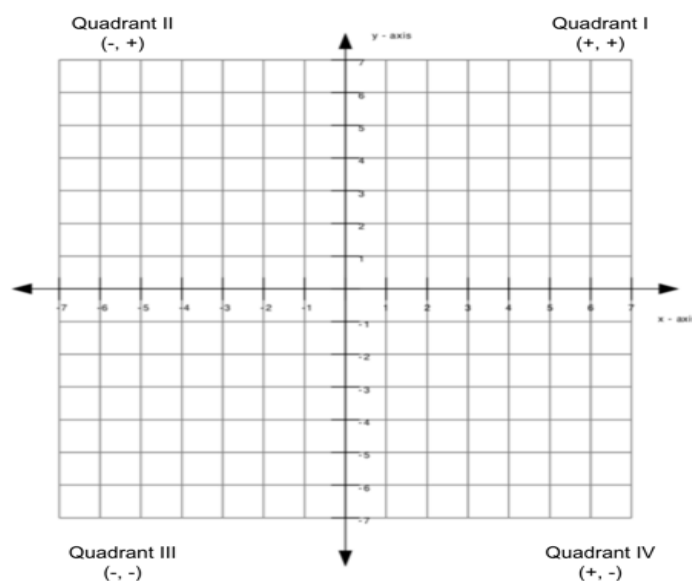
Rahul and Pranav are two best friends living in a city. They both study in the same school of their locality but stay far away from each other. Rahul has to travel 3 Km East and then 4 Km North to reach home from school. Pranav has to travel 5 km East and then 6 km north to reach home.

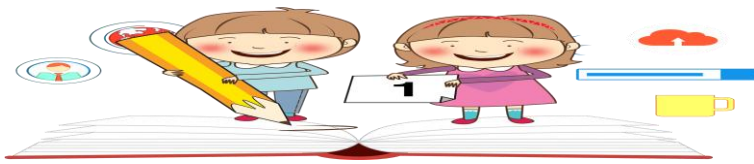


- 1) What is the shortest distance between school and Rahul's home?



- 2) Rahul wants to meet Pranav because Pranav was absent from school due to illness. Plot the graph for the above situation and find out the shortest distance which Rahul would travel to reach Pranav's home?





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BOX OFFICE

After COVID-19 lockdown, when doors of multiplexes were open with all precautionary measures and COVID-19 guidelines, the prices of tickets got changed and reduced to meet losses and cross cuttings. So looking at reduced prices Peter decided to go for a movie along with his family and friends to a nearby PVR cinemas.

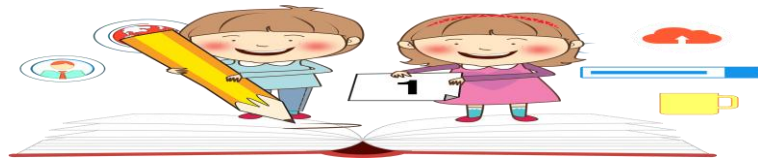
BEFORE COVID

	2D Movies		3D Movies	
	Existing Rates	Enhanced Rates	Existing Rates	Enhanced Rates
(1) Executive Class	Rs.100	Rs.125	Rs.100	Rs.150
(2) Royal Class	Rs.150	Rs.200	Rs.150	Rs.225

AFTER COVID



- Peter paid total ₹ 360/-. Let X = number of adults, Y = no of kids. Express this situation algebraically
 - $90x+60y=360$
 - $60x+90y=360$
 - $60x+60y=360$
 - $90x+90y=360$
- Peter paid ₹ 540/- for movie. There are two adults in his family. How many kids are there in family?
 - 5
 - 6
 - 7
 - 8
- Peter's sister Kusum wanted to watch movie with her husband and three kids. Peter also joins them. How much money they have to pay for the movie?
 - ₹ 540
 - ₹ Rs. 360
 - ₹ 450
 - ₹ 500



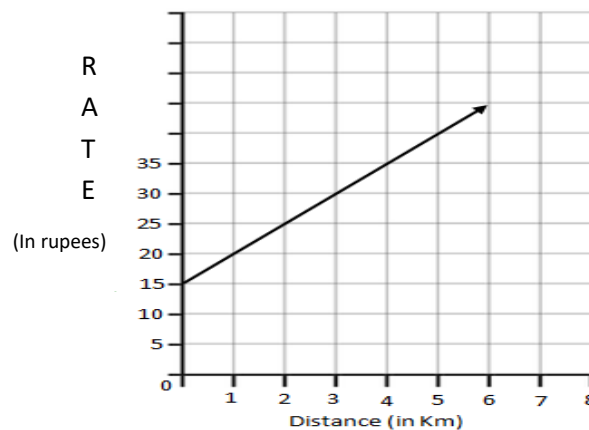
**Challenge
Yourself...**



RIDE AT DOORSTEP

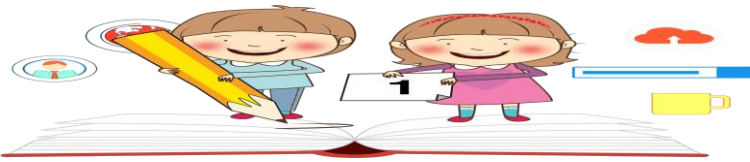


Now a days the roads are very crowded. People prefer to travel by taxi rather than taking out their own vehicle due to overcrowded roads and increasing traffic violations. According to recent study, 95% of the people travel by taxi or on foot. Jhanvi booked ola taxi for herself. The taxi driver charges rate as shown graphically. There are some fixed charges for every ride and ₹ 5/- per km.



- 1) What are the fixed charges for every ride?_____
- 2) Jhanvi travelled for 3 kms during cab pool for her work place. How much Jhanvi has to pay?

- 3) Another customer Jack paid ₹ 55/- to taxi driver. How far is his home from the pickup point?
a) 8 km b) 6 km c)10 km d)11 km



**Challenge
Yourself...**



MATH'S OLYMPIAD

Maths Olympiad



100 students of a class X participated in a Math's Olympiad exam conducted by SOF, out of them top most 4 students of that exam qualified for the final round. The data below shows how the 4 students got selected for the final round, based on no. of questions attempted, no. of correct and incorrect questions.

STUDENTS	Number of Questions answered	Correct Answers	Incorrect Answers	Total Marks
1	40	20	20	15
2	38	30	08	28
3	40	08	32	00
4	X	50	Y	42

On basis of above observation, answer the questions given below:

- 1) Total number of questions attempted by 4th student
- 2) Incorrect answers attempted by 4th student
- 3) Marks allotted to each correct answer
- 4) Marks deducted for each incorrect answer

1) _____
2) _____
3) _____
4) _____



**Challenge
Yourself...**



DEER PARK



The table shows two data sets for the projected growth of a deer population in a forest.

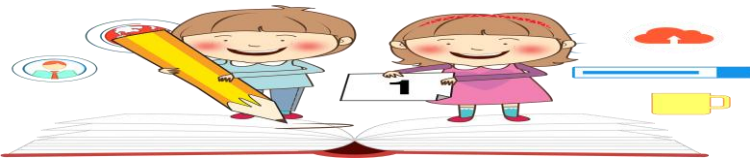
Year	Set A	Set B
2012	200	200
2013	224	224
2014	248	251
2015	272	281
2016	296	314
2017	320	350
2018	344	389

The deer population in the United States is estimated at over 20 million. In most states, the population is managed by the state's Department of Fish and Wildlife.

- 1) Use set A to predict the Deer population in 2022.

- 2) Use set B to predict the Deer population in 2022.

- 3) Using SetA, when does the deer population exceed 500?



**Challenge
Yourself...**



BARCODE



Most grocery products include an identifying Bar Code on their wrappers. Many supermarkets use these bar codes for totalling sales at the checkout using a light pen to read this code. Shown here is an 8-digit version of one such bar code. The 8-digit bar code number is divided into 3 parts:

Retailer's Code: 1st & 2nd digit (from left)

Product Code: 3rd to 7th digit

Check digit: 8th digit.

For the bar code shown below, the different parts are;

Retailer Code: 00

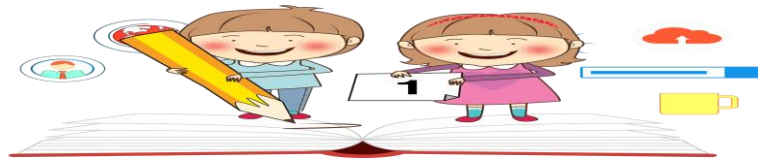
Product Code: 34600

Check digit: 9

The Barcode is chosen so that

$3 \times (1\text{st} + 3\text{rd} + 5\text{th} + 7\text{th digit}) + (2\text{nd} + 4\text{th} + 6\text{th} + 8\text{th digit})$ is exactly divisible by 10.





**Challenge
Yourself...**

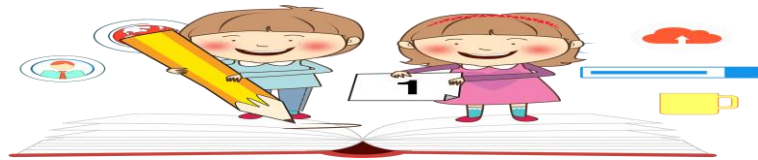


- 1) If x is the sum of digits at odd places and y is the sum of digits at even places of a 8 digit bar code, what is the general rule that the code should satisfy?
 - a) $x + y$ should be a multiple of 10
 - b) $3 + x + y$ should be a multiple of 10.
 - c) $3x + y$ should be a multiple of 10
 - d) $3(x + y)$ should be a multiple of 10.

- 2) Shown here is the Barcode that was printed on the label of a toy. But the 7th digit of the code was scratched out.



- 3) Which of the following could be the Barcode?
 - a) 5016860
 - b) 50168620
 - c) 16864
 - d) 16860



**Challenge
Yourself...**

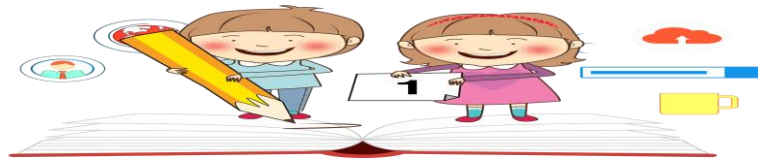


TOP GEAR



A car magazine uses a rating system to evaluate new cars and gives the award of “**The car of the year**” to the car with the highest total score. Five new cars are being evaluated, and their ratings are shown in the table.

MODEL	SAFETY (S)	FUEL EFFICIENCY(F)	EXTERNAL APPEARANCE(E)	INTERIOR (T)
CA	3	1	2	3
M2	2	2	2	2
SP	3	1	3	2
N1	1	3	3	3
KK	3	2	3	2



**Challenge
Yourself...**



The ratings are interpreted as follows:



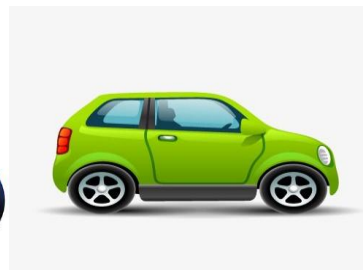
To calculate the total score for a car, the car magazine uses the following rule, which is a weighted sum of the individual score points:

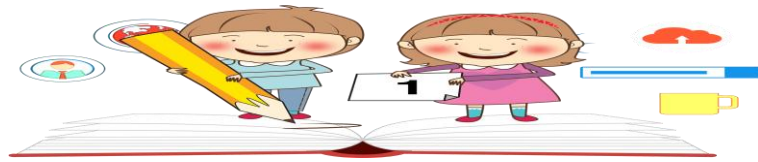
$$\text{Total score} = (3 \times S) + F + E + T$$

- 1) Calculate the total score for car “SP”.

Total score for “SP”:

- 2) For Mr. Rai safety features and internal fittings are the only features to rate the car if he gives five times more weight age to safety features that internal fittings then which cardo you think Mr. Rai will buy out of the above?





**Challenge
Yourself...**



MOBILE BATTERY



You are on an overnight train journey and the power is out. You at any cost want that your phone battery does not die and you remain connected with the world outside. Sadly, it reads 70%, you know it will survive for approx. 10 hours, if you do not waste it. You want to watch YOUTUBE and play LUDOTO pass your time on mobile. Assuming that you will sleep for 6 hours and active for 4 hours.

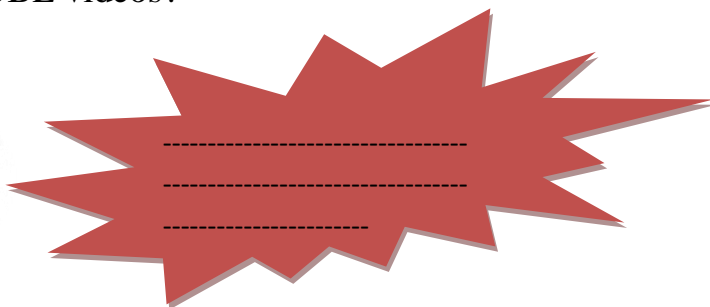
Also you know that:-

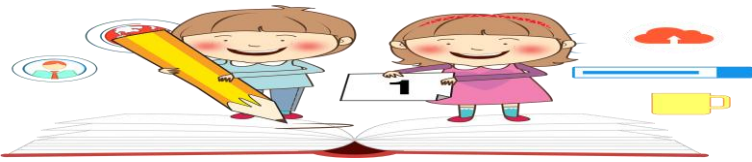
LUDO drain rate = 25% BPH

Normal browsing and YOUTUBE drain rate = 10 % BPH

BPH = battery per hour

Further you want your phone survive with at least 20 % of battery till morning. If you played LUDO for 1 hour then how many hours more you can use your phone for normal browsing and watching YOUTUBE videos?





**Challenge
Yourself...**



BIRTHDAY AT PARK

Birthdays are always special for everyone especially for kids. The decorations, the gifts, the cake, the goodie bag ideas for birthday parties is what they enjoy the most. In fact, kids get so excited about the following year's celebration that it is not unusual for them to start planning the next party before the last guest leaves.

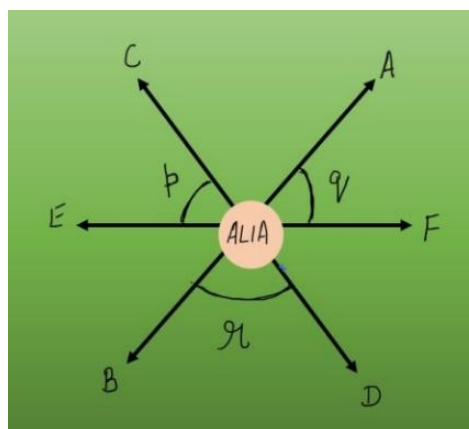
It is Alia's birthday today. She arranged a party in her garden. Six of the friends have come to her home for her birthday. After having little snacks, everyone gathered for a game. Alia has made a ring with 6 strings attached to it. She puts it on her waist and stands in the middle of the ground and tells each of the friends to hold the loose end of the string. They all do in such a way that 2 friends each align in line with Alia.

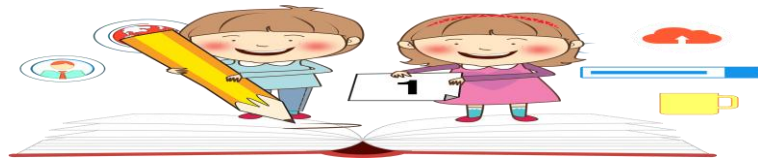


- 1) The friends are standing at A, B, C, D, E and F, respectively.

If p , q and r are in the ratio $1:2:3$ then find:

- The value of q is _____.
- The angle made by the strings connecting Alia to her friends standing at A and D
- What do you observe?





**Challenge
Yourself...**

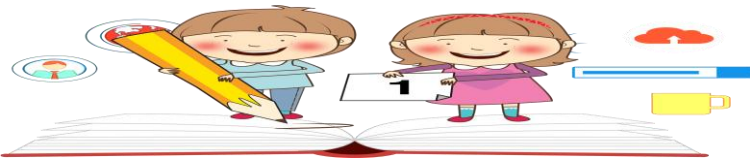


- 2) What must be the value of x so that the table top is parallel to the seats attached to it? Given that

$$a = 5(x - 8^\circ) \text{ and } b = -2(-2x + 25^\circ).$$



- 3) Find the value of angle made by the seat with the leg of table shown by 'c' in the figure. If both the legs are equally inclined to the table top.



**Challenge
Yourself...**



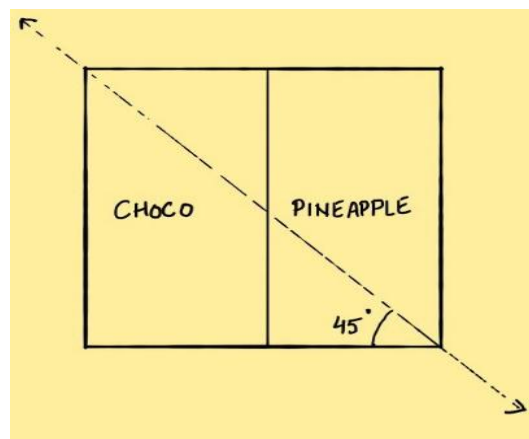
CHILDREN'S DAY CELEBRATIONS

Children's Day is celebrated every year on November 14 remembering the extreme fondness of Pandit Jawaharlal Nehru for children. This year due to COVID-19 the



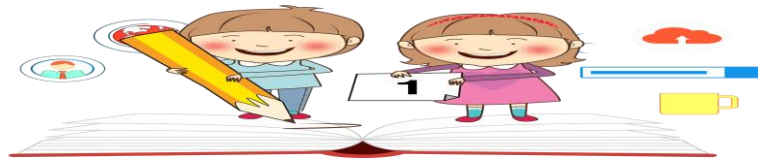
celebrations could not be planned as earlier times. The children of the orphanage home are meant to always feel happiness and love. Mr. John, a renowned baker in Indore did not allow the lockdown to set down the vibe of Children's day for children at orphanage. He wanted to let the children experience the joy that we adults can

bring to them. He baked a cake for the children of orphanage on children's day and organized some activities for them.



Assuming that he prepared a cubical cake. The cake was divided into 2 sections. Chocolate and Pineapple. But at the time of delivery, he observed that he did not have that big a box to pack it. So, he smartly divided the cake with diagonal line so that each cake had both the flavors.

- 1) What can be the different options to divide the cake for packaging so as to include both the flavors (draw and explain)?
- 2) What is the ratio of length, width, and diagonal line along which the cake was cut? Give reasons in support of your answer.
- 3) If the diagonal line is 36cms then what will be the dimensions of the cake?



**Challenge
Yourself...**



FRIENDSHIP DAY

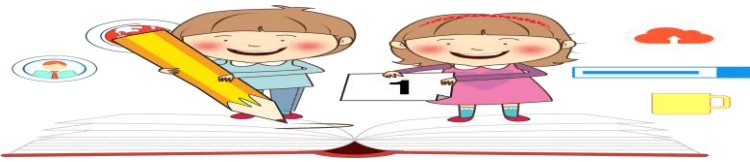
Saumya had colored papers in the shape of isosceles triangles with angles measuring 70° and 40° . She decorated her room on friendship day



Saumya's friend Mehak was very excited to see the decoration and she also wanted to help Saumya. So she asked her to give few colored triangles which were left with her. Mehak folded the isosceles triangles into exactly half (by folding it from the middle)

- 1) Which type of triangle Mehak will get?
 - a) Isosceles
 - b) Equilateral
 - c) Isosceles Right angled
 - d) Right Angled

- 2) What is the measure of the smallest angle in Mehak's triangle?
 - a) 70°
 - b) 40°
 - c) 45°
 - d) 20°

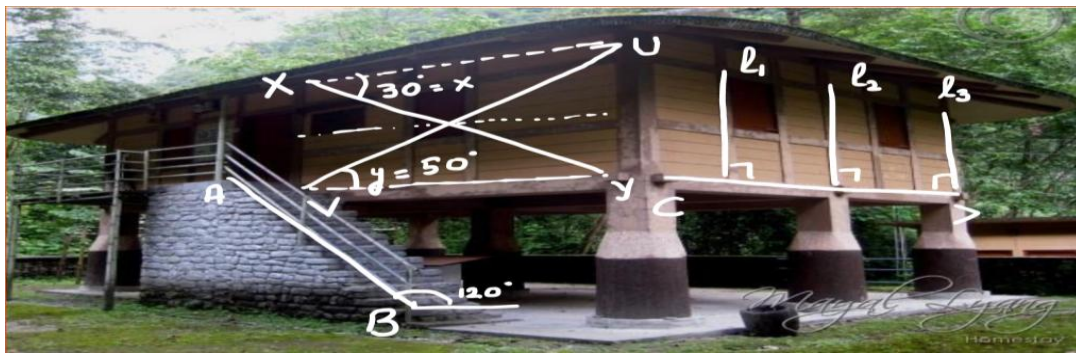


**Challenge
Yourself...**



LEPCHA: A TRADITIONAL HOUSE

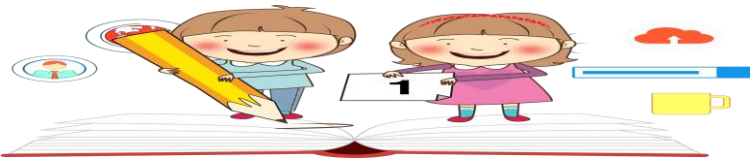
Ashmit along with her friends Amit, Surbhi & Diya planned a tour to Sikkim to complete a project on the culture and heritage of Sikkim. While doing so they decided to reside in the Lepcha Traditional house.



The Lepcha people are aboriginal inhabitants of Sikkim. The construction of this house displays the ingenuity of an age-old tradition of laying the superstructure on open surface (over stone slabs) to counter the effects of powerful earthquakes.

While admiring the beauty of the place Diya analyzed few mathematical concepts and asked the following questions to her friends-

- 1) If the first step is inclined at angle 120° with the line AB, then find the angle of inclination of middle step with the same line?
 - a) 120° b) 40° c) 240° d) 130°
- 2) Which of the following relation is correct for lines l_1 , l_2 & l_3 ?
 - a) $l_1 \parallel l_2$ b) $l_2 \parallel l_3$ c) $l_1 \parallel l_3$ d) All of these
- 3). She does not like the side view of the house and wants to change it. So, she tied two wooden sticks XY & UV as shown above. At what angles she tied the Stick to each other if $\angle x = 30^\circ$ & $\angle y = 50^\circ$.
 - a) 150° b) 130° c) 100° d) 80°



**Challenge
Yourself...**



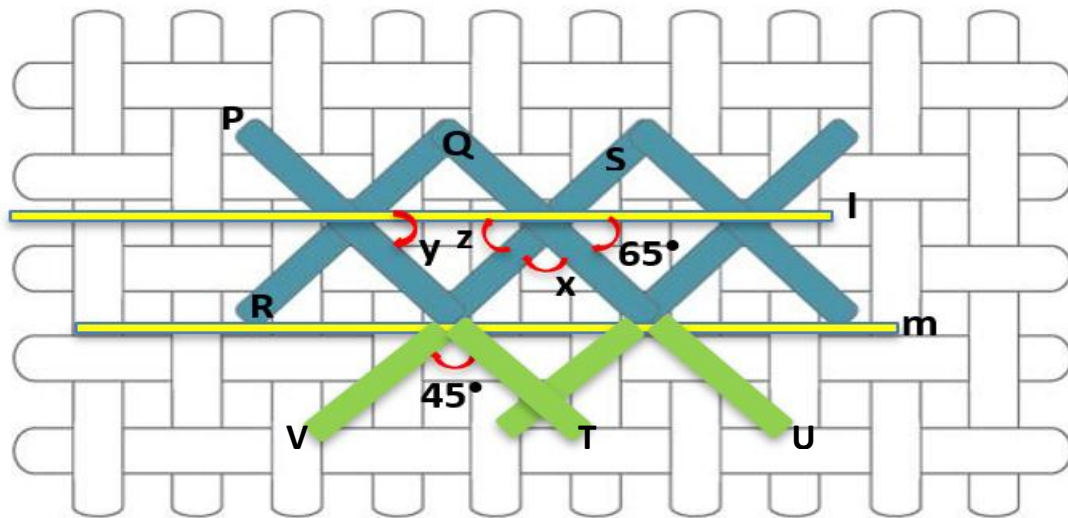
MATHEMATICS INDESIGNING



Sarah is a fashion design teacher. Recently she is training her students how to do cross stitching.

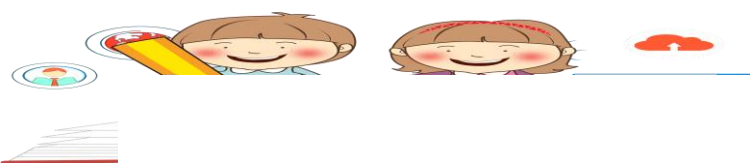


All of them made different sets. To bring symmetry and neatness in their work, she took help of mathematical concepts of lines and angles. She gave them the following diagrams to follow where $l \parallel m$, $PT \parallel QU$ and $RQ \parallel VS$.



She also asked them a few questions related to the above figure:

- 1) At what acute angle line QU should be inclined with line m?
- 2) Find a relation between the angles x, y and z.
- 3) Find the value of angle z.

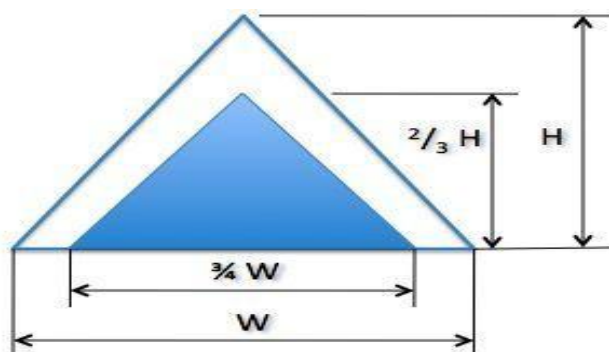


DESIGNING GARDEN

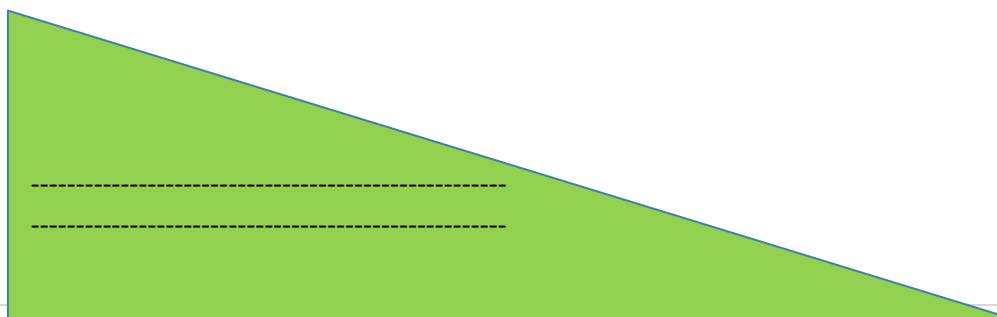
The garden is considered to be the most beautiful part of the house where one can take a break from the daily monotonous life and relax. It helps in making and mending bonds with the family members when the whole family gathers to chit chat in the garden.

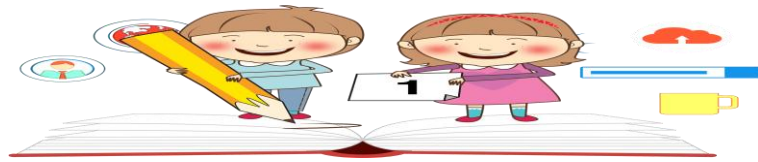
The garden can be beneficial in many known and unknown ways. It plays a significant role in maintaining good health and a pleasant environment. As urbanization is increasing gradually, the Earth is losing all its greenness, so planting a few trees in the garden will also help Mother Nature to heal.

Teena wants to make a triangular garden in the backyard of her house. She thought of some mathematical concepts which she can learn and use in her daily life. The structure of the garden is given below. Study the figure and answer the following questions:



- 1) If the shaded portion is the garden then find what fraction of the triangle is the garden ?

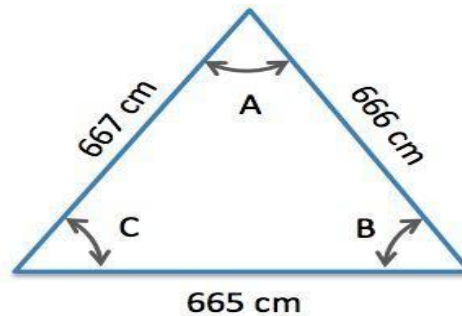




**Challenge
Yourself...**

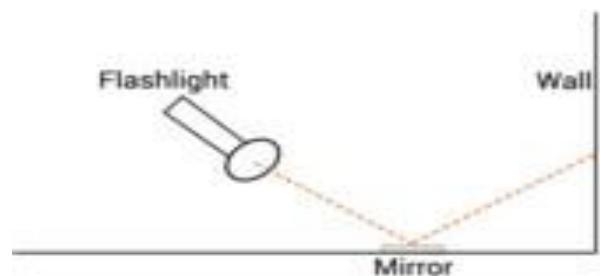


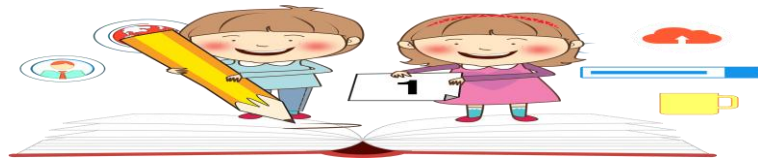
- 2) If the triangular measurements of the figure then which



garden has the following angles as shown in the given angle is the largest?

- a) A
 - b) B
 - c) C
 - d) None of these
- 3) Sarika, Teena's friend lost her precious diamond in her garden and shines her flashlight into a mirror on the floor of the garden and sees the ray of light hit the wall on the other side of the garden. As she moves closer to the mirror, holding the light at same height, how will the ray of light on the wall change?
- a) It moves lower down the wall
 - b) It stays at the same spot
 - c) It moves higher up the wall
 - d) None of these.



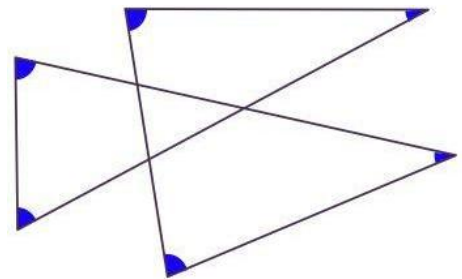


**Challenge
Yourself...**



PLAYING

Playing is essential for development because it contributes to the cognitive, physical, social, and emotional well-being of children and youth. Play also offers an ideal opportunity for parents to engage fully with their children. Despite the benefits derived from play for both children and parents, time for free play has been markedly reduced for some children. This report addresses a variety of factors that have reduced play, including a hurried lifestyle, changes in family structure, and increased attention to academics and enrichment activities at the expense of recess or free child-centered play.

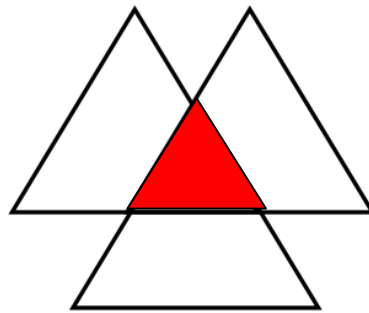
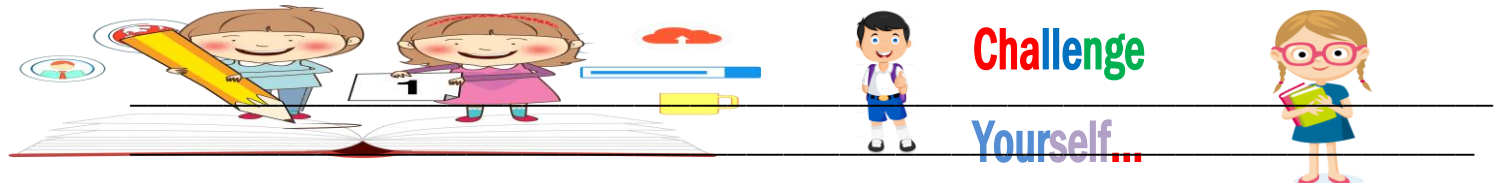


Anil and his 6 friends planned to play a game and the representation of the friends is as shown in the given figure.



- 1) 6 friends are playing a game in which they aligned themselves on the colored positions as shown in figure. What will be the sum of angles formed at their positions?

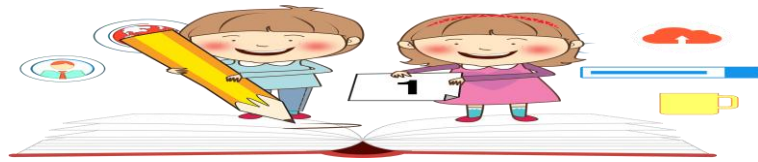




2. Now the students are arranged to create the overlapping equilateral triangles as shown above.

Each triangle has sides of length 4 m. The triangles are crossing each other at mid-points of sides.

Find the area of colored overlapped region.

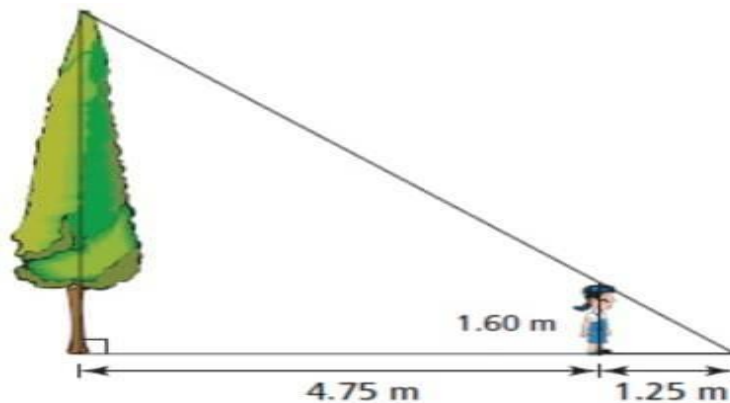


**Challenge
Yourself...**



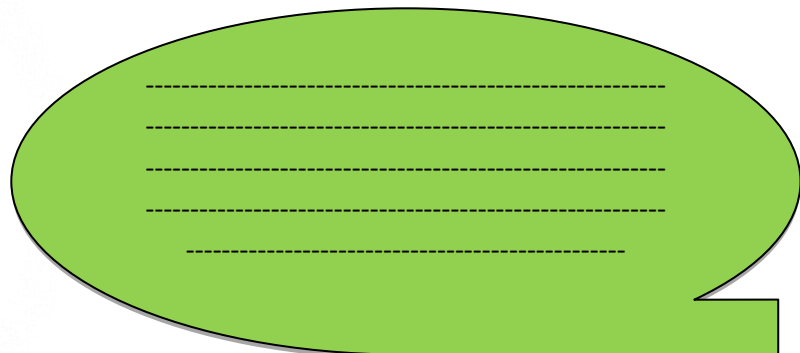
SIMILARITY AND CONGRUENCE

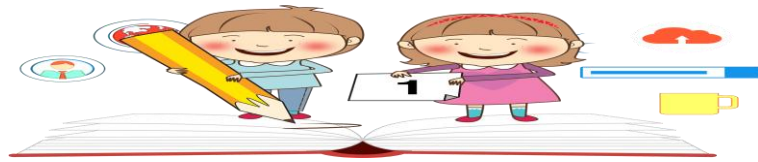
In mathematics, we say that two objects are similar if they have the same shape, but not necessarily the same size. This means that we can obtain one figure from the other through a process of expansion or contraction, possibly followed by translation, rotation or reflection. If the objects also have the same size, they are congruent.



Shelly, who is 1.60 m tall, cast a shadow that is 1.25 m long. Her shadow extends to the end of a tree's shadow when she stands 4.75 m from the tree.

- 1) What is the height of the tree?



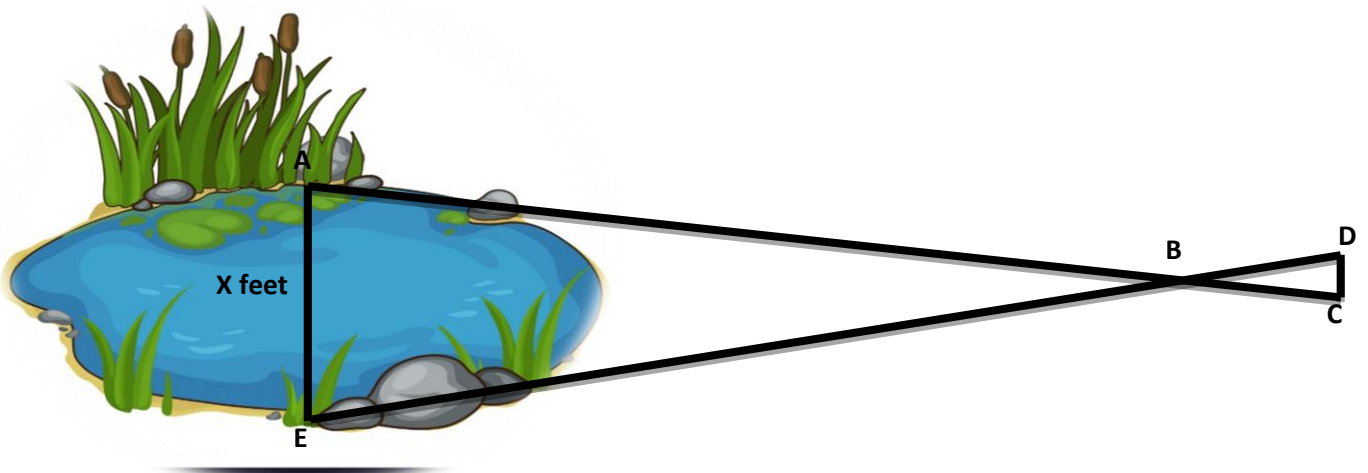


**Challenge
Yourself...**



Shelly is a summer camp counselor who has drawn a figure and wanted to teach the students the concept of triangles. She wanted to find the length x , in feet across the lake as represented in the given figure. The lengths AB , EB , BD and CD on the sketch were determined to be 1800 feet, 1400 feet, 700 feet and 800 feet respectively. Segments AC and DE intersect at B and angle AEB and angle CDB have same measure.

2) What is the measure of x ?





**Challenge
Yourself...**



CRAFT MELA



Craft Mela is an annual event that is organized on a large scale in various part of the country. The fair is aimed at bringing to light the enormous talent of artisans and craftsmen in India who display their exquisite handlooms and handicrafts before a large audience at the fair.

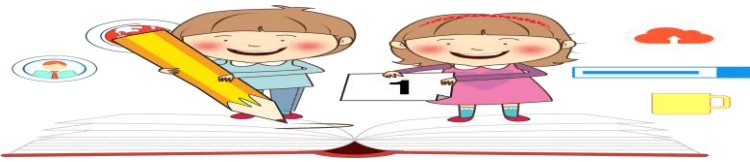
A craft Mela is organized by Welfare Association to promote the art and culture of tribal people. The pandal is to be decorated by using string of bulbs all around the field.

There are two options either to arrange it in a rectangular field $ABEF$ or a parallelogram $ABCD$ with equal area. If $AB = 12\text{m}$, $BC = 11\text{m}$, $AF = 8\text{m}$.

- 1) What shape of the field should be chosen to minimize the expense of bulbs?

- 2) Justify your answer why have you chosen a particular shape?

- 3) Find the length of BE .



**Challenge
Yourself...**



OLD AGE HOME

A retirement home – sometimes called an old people's home or old age home, although old people's home can also refer to a nursing home – is a multi-residence housing facility intended for the elderly. Typically, each person or couple in the home has an apartment-style room or suite of rooms.

A plot is in the form of a parallelogram $ABCD$. Owner of this plot wants to build an old age home, a dispensary, a park and a health Centre for the elderly people as shown in the figure



1.

Are all the 4 areas equal?

a) Yes b) No . Justify your answer

2. If the plot is given entirely to an old age home and the Members of the old age home in consensus decided to make use of this plot for making a yoga park and planting medicinal herbs in the rest of the area as shown below.



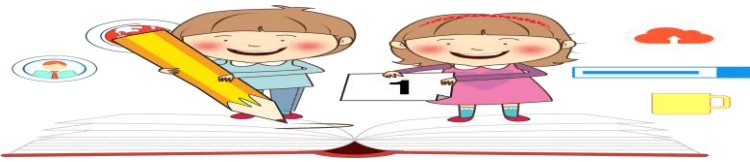
**Challenge
Yourself...**



If the land is in the shape of a parallelogram $ABCD$ of area 900m^2 , then:

- 1) Choose the correct mathematical concept which will be required to find the area of the Yoga Park
 - a) Diagonals of a parallelogram are equal
 - b) Triangle and Parallelogram on same base and between same parallel, Area of triangle will be half the area of parallelogram.
 - c) Two triangles between same parallel lines and on same base are equal in area.
 - d) Diagonals of a parallelogram are congruent
- 2) Calculate the area of the land which will be used to plant medicinal herbs.





**Challenge
Yourself...**



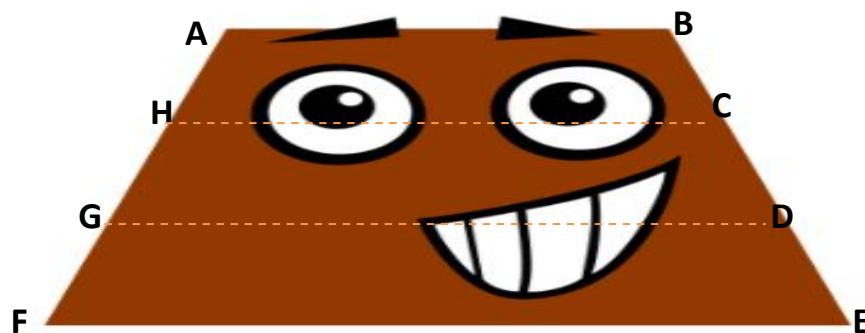
MY TEACHER

A class teacher gave colored papers to the students of her class. She was starting with the

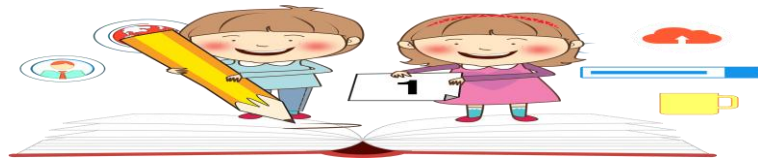


topic of quadrilaterals. So, she took a piece of paper and made a shape of a quadrilateral. Later on, she asked them to make parallelogram from it using paper folding.

Sohan wants to show gratitude towards his teacher by giving her a card made by him. He has three pieces of a trapezium pasted one above the other as shown in the figure. These pieces are arranged in a way that $AB \parallel HC \parallel GD \parallel FE$. Also, $BC = CD = DE$ and $GF = 6 \text{ cm}$. He wants to decorate the card by pasting a coloured tape on the non-parallel sides of the trapezium.



- 1) How much colored tape will be required if $DE = 4 \text{ cm}$.
During the same teaching period each student was given four broom sticks of lengths $8\text{cm}, 8\text{cm}, 5\text{cm}, 5\text{cm}$, to make different types of quadrilaterals.
- 2) How many quadrilaterals can be formed using these sticks?
- 3) What type of quadrilaterals are formed?

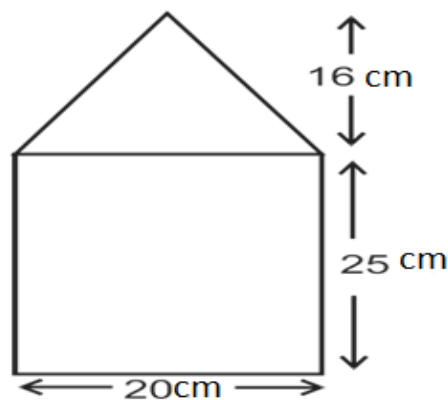
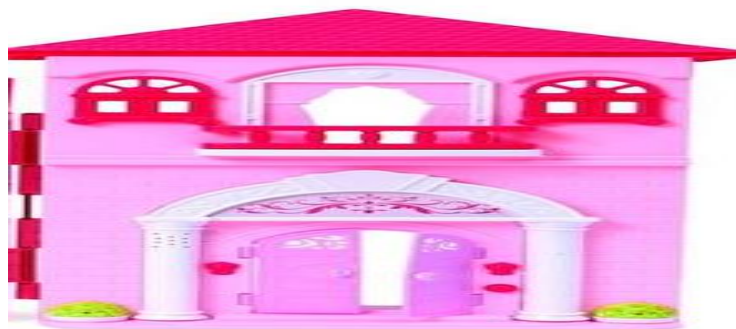


**Challenge
Yourself...**



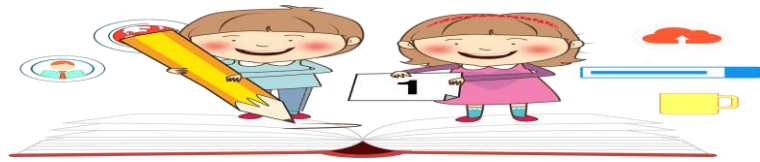
DOLL HOUSE

A dollhouse or doll's house is a toy home made in miniature. Since the early 20th century doll houses have primarily been the domain of children, but their collection and crafting is also hobby for many adults.



The mathematical model of the front of the building is as shown in the above figure:

- 1) The rectangular part of the building is desired to be painted in four colors, each covering equal area. The colors to be used are white, red, yellow and blue. Each painted part should be triangular in shape. Suggest how it can be done? What is the area of each part?

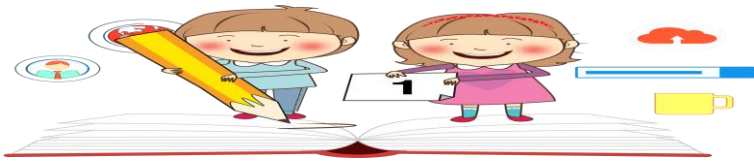


**Challenge
Yourself...**



- 2) If the triangular part on top of the building is to be painted white, will it cost more or less than each part on the rectangular front. (All colors have same rate)

- 3) Find the cost of painting the front part at a rate of ₹ 30 per m^2



Challenge
Yourself...



BEST OUT OF WASTE

Riya bought a Delmonte can from the supermarket, she wants to use the can afterwards as a flower pot by wrapping a foil around it. The can has a radius 7cm and a height 14cm. Her mother gave her ₹ 1000 to purchase the can and decorate it.

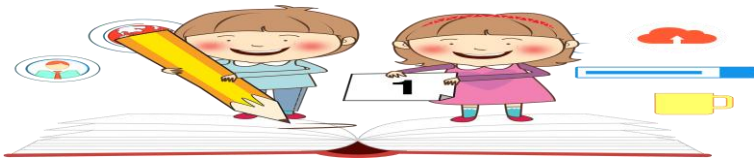


- 1) How much foil is needed to cover the can?

- 2) How much money she needs to spend on purchasing silver foil costing ₹ 75 per square centimeter?

- 3) If cost of each can is ₹ 150, then how much money will she return to her mother?

- 4) Can she buy one more sheet with the same dimensions? Justify.



Challenge
Yourself...



AFTER COVID:BACK TO SCHOOL

What if 'keeping your distance' becomes the new school normal?

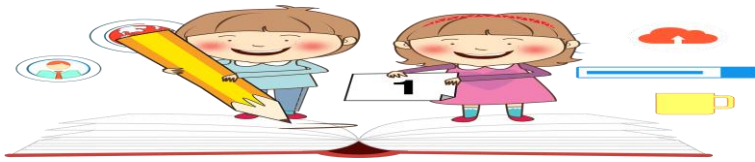


Tuesday was the first day back to school for all elementary to high school students in Taiwan. That's due to an extended winter break over fears COVID-19. Schools have a lot of new measures to help prevent an outbreak at school.

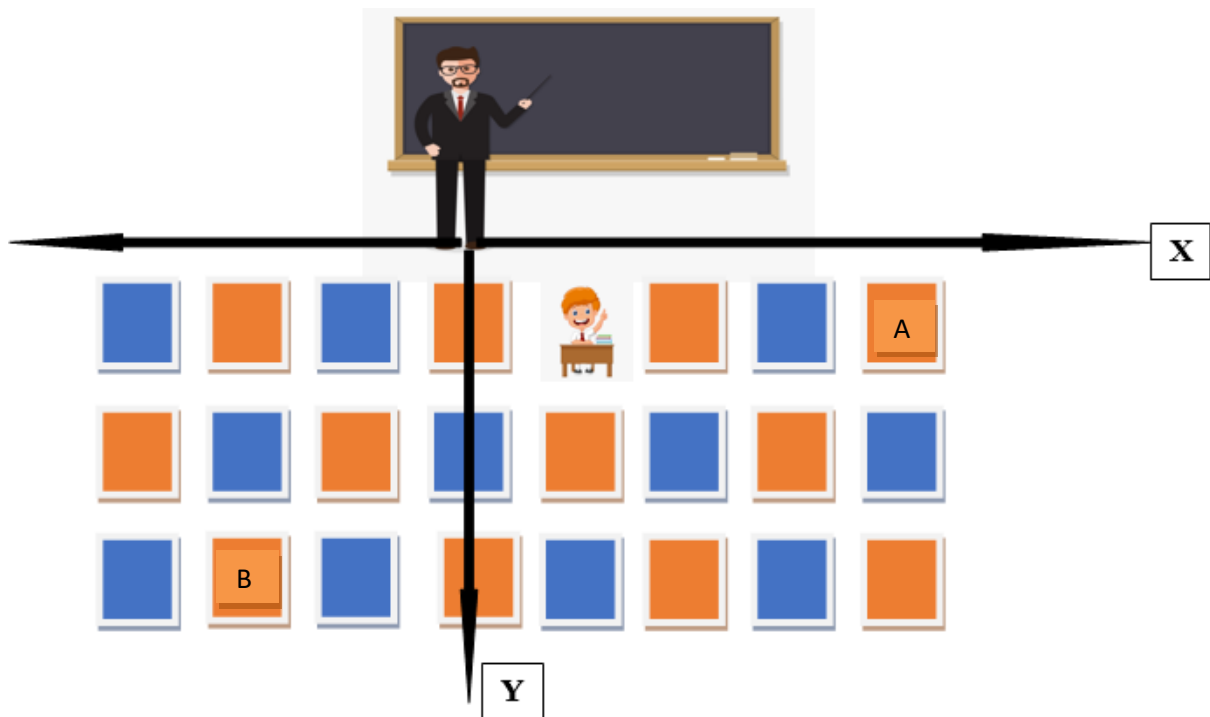
Children in Taiwan are back to school but school life has changed. Many schools are using new ways to prevent disease like these homemade dividers. At Dajia Elementary School, every student has their own divider to prevent the spread of viruses through airborne droplets.

During lunchtime, the children keep a distance from each other when they're eating. Some schools don't allow their students to talk to each other during lunch.

Once in class, the children were seated in separated rows wearing masks. The students need to disinfect their shoes before they enter the campus and get their temperatures checked. Windows are also kept open so fresh air can come in and now each class has a new sanitary monitor. His responsibility is to disinfect the classroom. From doorknobs to desktops, the sanitary monitors are in charge of keeping the classroom clean.



**Challenge
Yourself...**



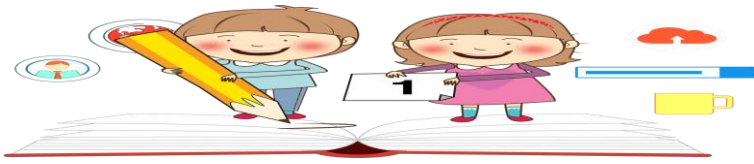
Shown here is the seating arrangement for a regular class. Keeping in mind the precautions to be taken after the schools reopen post Covid19. Do remember you can't choose the blue desks to ensure social distancing. The coordinates of the teacher's position are $(0, 0)$.

Vikram has already occupied his position with coordinates $(1, -1)$.

- 1) Write the coordinates for the sitting position of student A.

- 2) If a student can only move either walking horizontal or vertical, how much is the minimum no. of units student B need to move to reach his/her teacher.

- 3) Considering only horizontal and vertical paths how much units is maximum distance between student A and Student B.



**Challenge
Yourself...**



ROHTANG TUNNEL!



Atal Tunnel (also known as Rohtang Tunnel) is a highway tunnel built under the Rohtang Pass in the eastern PirPanjal range of the Himalayas on the Leh-Manali Highway in Himachal Pradesh, India. At a length of 9.02 km, it is the longest tunnel above 10,000 feet (3,048 m) in the world and is named after former Prime Minister of India, Atal Bihari Vajpayee. The tunnel reduces the travel time and overall distance between Manali and Keylong on the way to Leh. Earth is excavated to make a railway tunnel.

Another similar tunnel shown in the picture of dimensions of radius 7 m and length 450 m. A level surface is laid inside the tunnel to carry the railway lines.



On the basis of the above information, answer the following questions:

- 1) How much volume of earth is removed to make the tunnel?
(a) 58700 m^3 (b) 61400 m^3 (c) 62700 m^3 (d) 69300 m^3
- 2) If the cost of excavation of 1 cubic meter is Rs 250, what is the total cost of Excavation?
(a) ₹ 17325000 (b) ₹ 34650000 (c) ₹ 8662500 (d) ₹ 12677500
- 3) A coating is to be done on the upper half of the inner tunnel. What is the Area of tunnel to be coated?
(a) 9900 m^2 (b) 8900 m^2 (c) 17800 m^2 (d) 19800 m^2



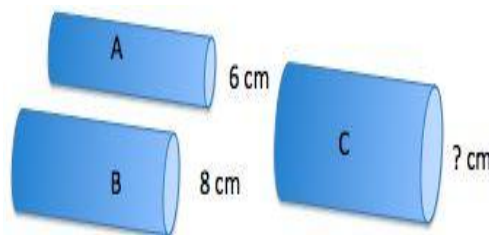
**Challenge
Yourself...**



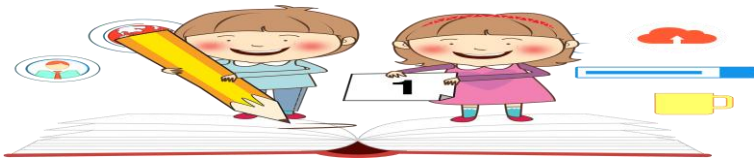
POOL TIME!



An old swimming pool in GYM KHANA CLUB, Kanpur needs renovation due to leaking pipes. While renovating the swimming pool club decides to replace its water supply lines for swimming pool. The current system uses two pipes A and B simultaneously connecting the source to the pool by a distance of 35 m. The circular cross-sections of pipe A & B have diameters 6cm and 8cm respectively.



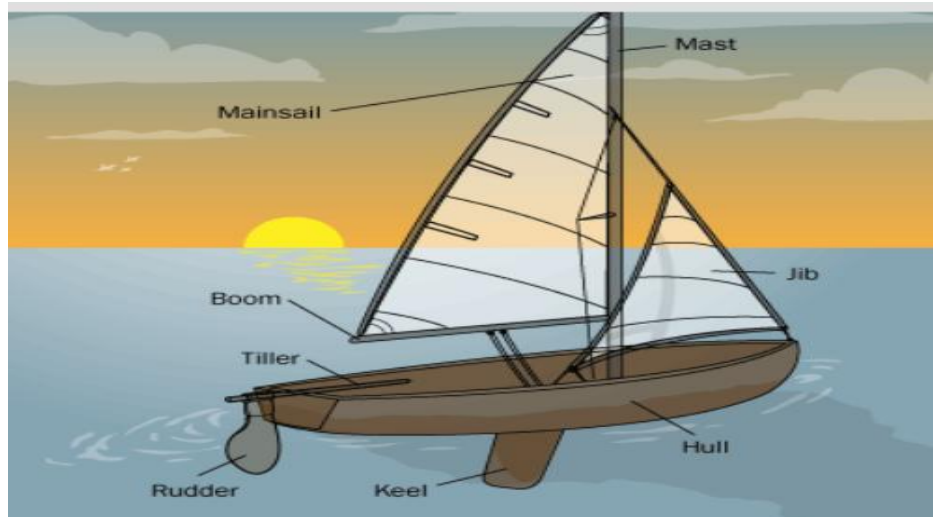
- 1) The club decides to use a single replacement pipe with the same capacity. What should be the diameter of the new pipe?
 a) 12cm b) 9cm c) 14cm d) 10cm
- 2) The cost of the pipe is Rs 450 per m. How much the club will have to pay for purchasing the pipe C?
 a) ₹ 15750 b) ₹ 12750 c) ₹ 15000 d) ₹ 17750
- 3) If the water is flowing at the rate of 7 km/hr through the pipe C then how much water (in liters) will be filled in the pool in 2 hrs.?
 a) 110000 L b) 50000 L c) 45000L d) 75000L



**Challenge
Yourself...**



SAIL BOAT



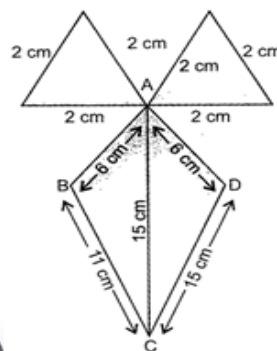
- 1) Rubin and his son are going on a vacation. They need to get a sailboat. They go to a shop to get material for the two sails. Help them find the area of the cloth required for the two sails.

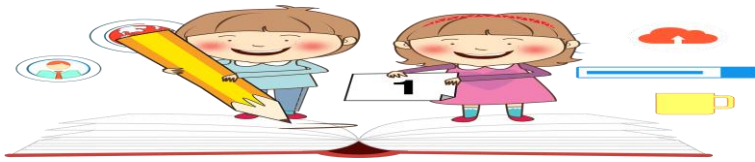
Dimensions of the bigger sail: 100 m X 100m X 160 m

Dimensions of the smaller sail: 41 m X 15 m X 28 m

Activity: My Space Craft

- 2) A Student made a project of his space craft using two scalene triangles and two equilateral triangles carved out of a thick sheet in which he tried to balance forces of equal triangles on both sides to uplift the flight of the space craft. Calculate the total area of sheet used in these two types of triangles he used in his project.



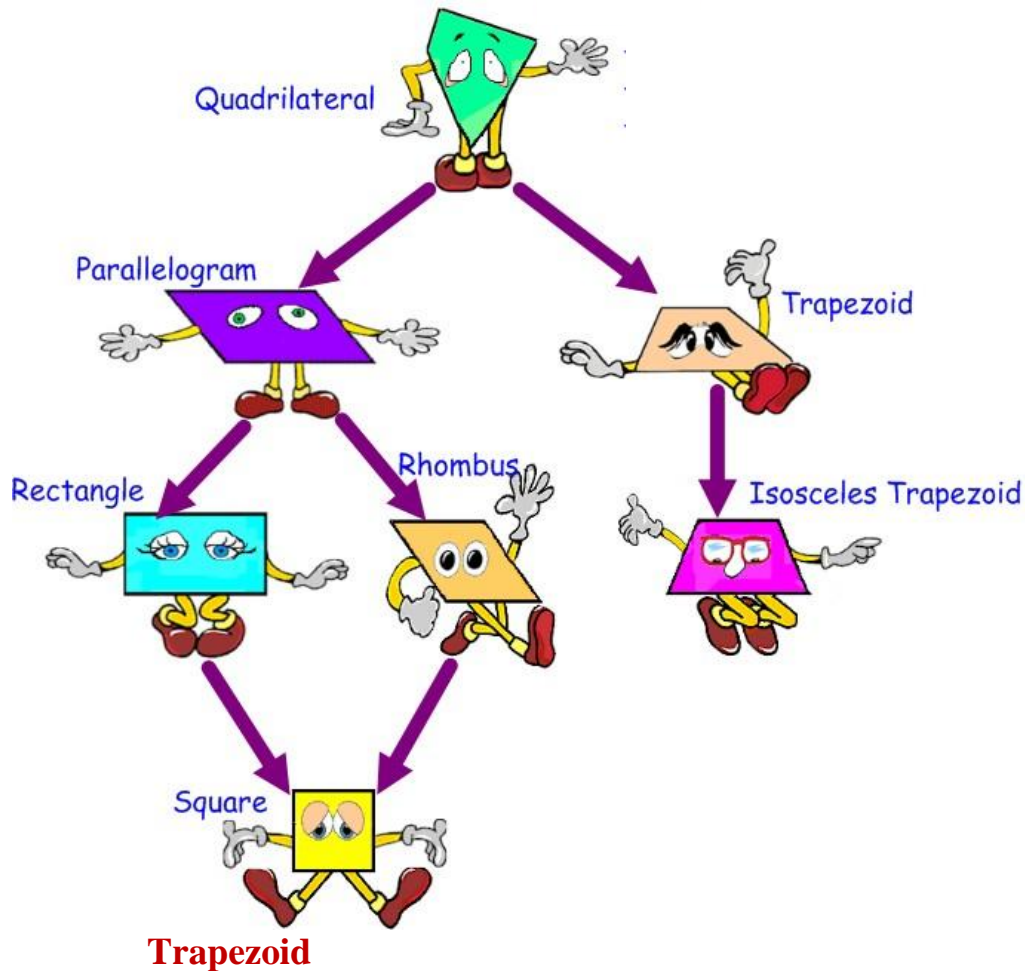


**Challenge
Yourself...**



THE QUADRILATERAL FAMILY TREE

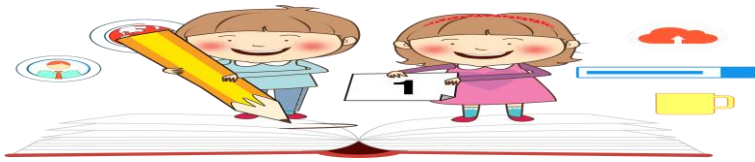
Given below is a family tree of quadrilaterals:



It is a type of quadrilateral with only one set of parallel sides.

Properties of Isosceles Trapezoids:

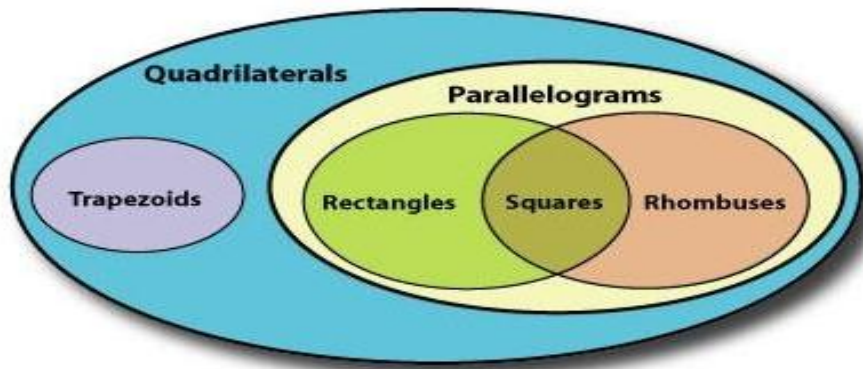
- 1. Diagonals are congruent.**
- 2. Opposite angles are supplementary.**
- 3. Base angles are congruent.**
- 4. Non parallel sides are Congruent.**



**Challenge
Yourself...**



Classification of types of quadrilaterals can also be shown in form of following pictorial Venn diagram.

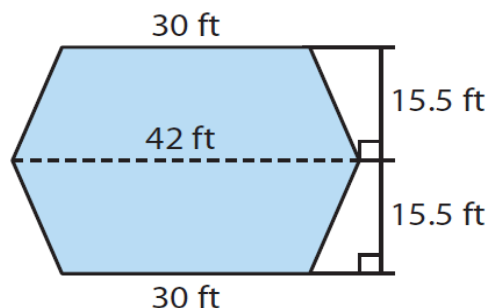


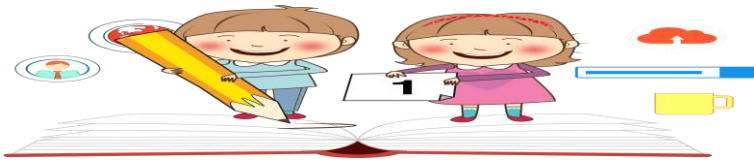
1) Based on above information answer following questions:

S.No	Statement	True / False
1.	Parallelograms are never trapezoids	
2.	All squares are rhombus	
3.	A rhombus is a rectangle	
4.	All parallelograms are rectangles	
5.	Isosceles trapezoids are trapezoids	
6.	In a square all sides are congruent	
7.	Parallel sides of an isosceles trapezoid are congruent	
8.	All quadrilaterals have 4 congruent sides	

2)

(A) The diagram shows the floor plan of a hotel lobby. Carpet costs 3 dollars per square foot. How much will it cost to carpet the lobby?





**Challenge
Yourself...**



- B) Ira bought a new table for her garden. She has to cover it with a plastic sheet to protect it from the heat. Help her find the area of the plastic sheet if the dimensions of the parallel sides are 10m and 5m and the distance between them is 6 m.

ARE YOU READY!!!! CHALLENGE AHEAD

Classify objects around you in your home as different types of quadrilaterals and also try to calculate their areas.



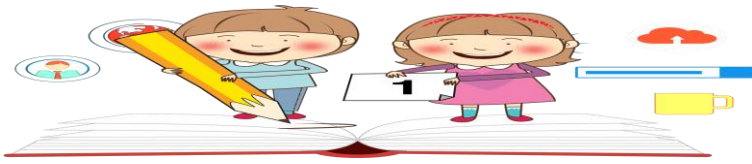
ROOM WINDOW



DESKTOP



CELL PHONE



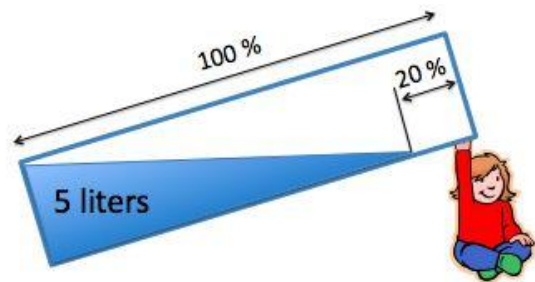
**Challenge
Yourself...**



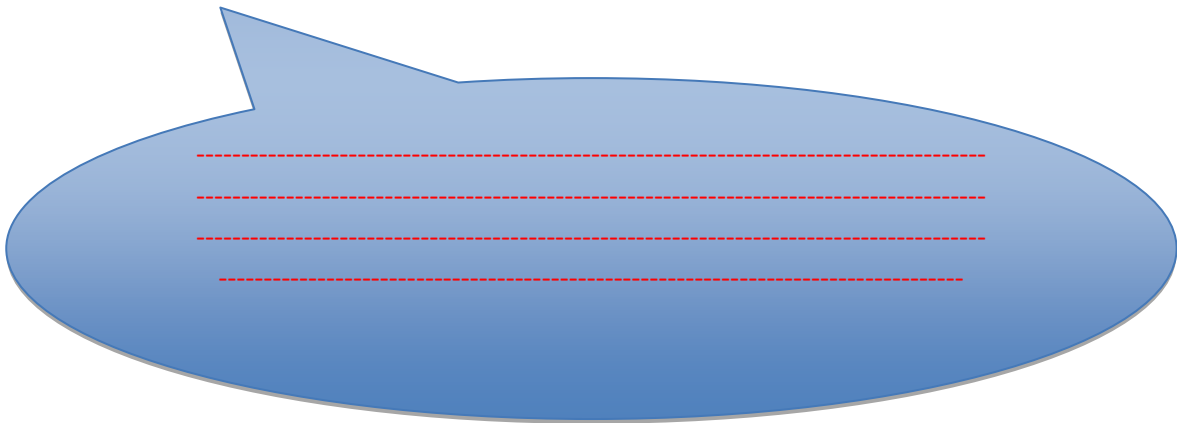
SEEPAGE

- 1) Reema bought an aquarium on her daughter's birthday .But after 2 months she realized that the filter had broken due to which she has to replace the filter as well as the water in the tank. The tank was full of water she tipped it on one side so 5 liters are left. How much water does the aquarium hold when it is full of water?

- a) 11 Litres
- b) 12 Litres
- c) 12.5 Litres
- d) 16 Litres



- 2) Reema wants to gift another aquarium to her friend. She wishes to gift wrap it. If the sum of the length, breadth and depth of the aquarium is 19 cm and the length of its diagonal is 11cm. How much wrapping paper is needed to wrap it?





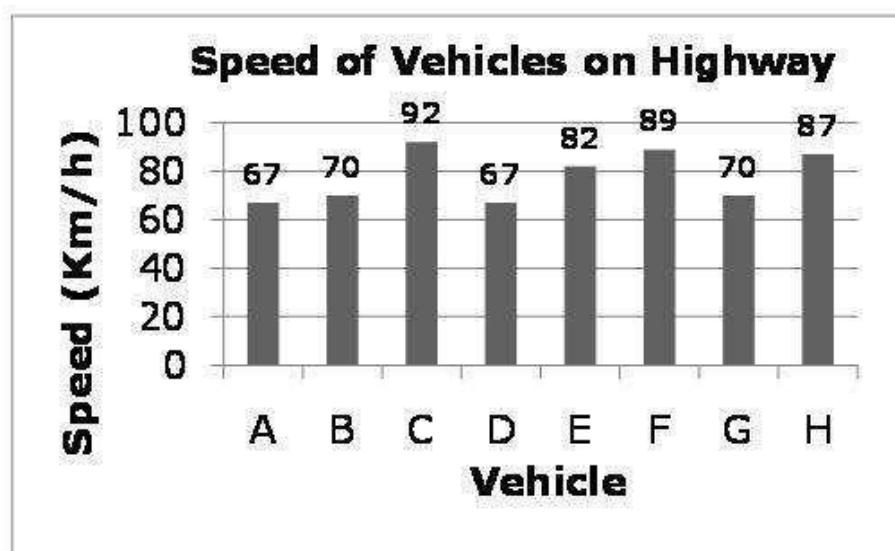
Challenge
Yourself...

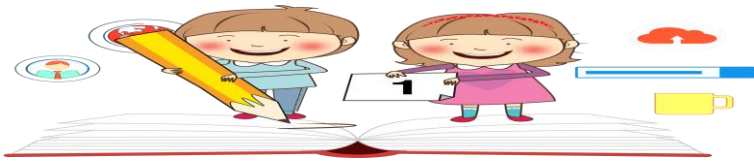


SPEED GUN



A radar speed gun (also radar gun and speed gun) is a device used to measure the speed of moving objects. It is used in law-enforcement to measure the speed of moving vehicles. A traffic police man using a speed radar gun to measure the speeds of different vehicles which are moving in a zone of speed limit 75km/h. The following graph shows the speed of vehicles on highway.





**Challenge
Yourself...**

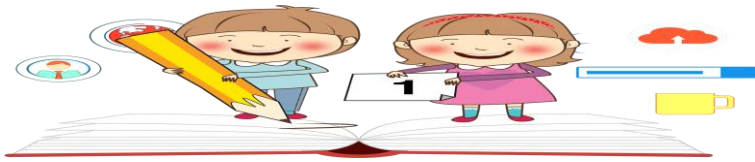


- 1) Which vehicles will get ticket(challan)?

- 2) Find the mean of speeds which are crossing the speed limit?

- 3) Find mean of all the speeds displayed in the graph.

- 4) If another vehicle comes with the speed of 50 km/h. Then by what value mean speed will change?



**Challenge
Yourself...**



BATTING AVERAGE

Rohit Sharma is a right-handed opening batsman and bowls right-arm off break occasionally. Rohit is widely popular for his aggressive style of batting where he likes to take the charge to the bowler. He is the only batsman in the world to hit three double centuries in ODI cricket. The glimpse of his carrier in all the four formats of cricket is given below.



Rohit Sharma

India

Personal Information

Born	Apr 30, 1987 (33 years)
Birth Place	Nagpur, Maharashtra
Height	---
Role	Batsman
Batting Style	Right Handed Bat
Bowling Style	Right-arm offbreak

Batting Career Summary

	M	Inn	NO	Runs	HS
Test	35	59	7	2288	212
ODI	224	217	32	9115	264
T20I	108	100	14	2773	118
IPL	200	195	28	5230	109

(M- Matches, Inn- Innings, NO-Not out, HS- Highest scores.)

- 1) What will be the average of his highest scores (HS) in all four formats?

- 2) How many times he got out in his ODI innings?



**Challenge
Yourself...**

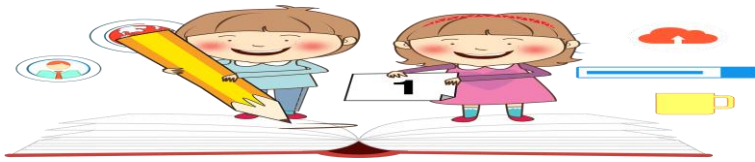


In cricket, a player's batting average is the total number of runs they have scored divided by the number of times they have been out, usually given to two decimal places. Since the number of runs a player scores and how often they get out are primarily measures of their own playing ability, and largely independent of their teammates, batting average is a good metric for an individual player's skill as a batsman. The batting average in cricket is the average number of runs a batsman scores per innings.

$$\text{Batting average} = \frac{\text{Runs scored}}{\text{Number of times out}}$$

- 3) What is his batting average in T 20 cricket format?

- 4) In which format of game batting average is most?



**Challenge
Yourself...**



SIBILING SURVEY

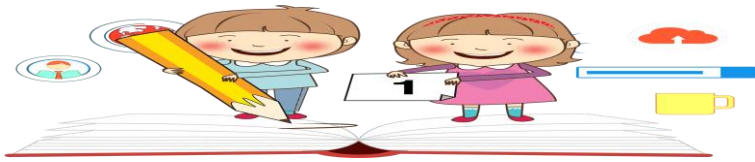


A sociologist studies how people act within societies and other groups. If you are interested in issues like gender roles, crime, or the way families interact, you might want to be a sociologist. Simmi a sociologist chose 300 students at random from each of the two schools and asked each student how many siblings he or she has. The results are shown in table below:

No. of Siblings	School 1	School 2
0	80	100
1	80	110
2	60	30
3	30	20
4	50	40

- 1) What is the median number of siblings for all the students surveyed?

- 2) If she excluded the families with no child, how median get affected?



Challenge
Yourself...



LET'S WATCH A MOVIE –

Samita and her family members go to watch a movie. When they reach the cinema premises, they see that there are three different types of movies available. Now, they are supposed to select the perfect movie that is enjoyable for all the members. The two types of movies available are URI and SIMBA.

COMPARISON OF SHOWS FOR URI			
THEATRE	MORNING SHOW	THEATRE	EVENING SHOW
PVR (Juhu)	Rs 185	PVR (Juhu)	Rs 415
PVR (ICON)	Rs 180	PVR (ICON)	Rs 355
Cinepolis (Andheri)	Rs 110	Cinepolis (Andheri)	Rs 230
Carnival (Andheri)	Rs 110	Carnival (Andheri)	Rs 270
INOX (R City)	Rs 138	INOX (R City)	Rs 314

SIMMBA TICKET RATES PRE AND POST GST			
THEATRE	MORNING SHOW	THEATRE	EVENING SHOW
PVR (Juhu)	Rs 280 (Pre GST) Rs 260 (Post GST)	PVR (Juhu)	Rs 550 (Pre GST) Rs 510 (Post GST)
Inox (R City)	Rs 150 (Pre GST) Rs 138 (Post GST)	Inox (R City)	Rs 350 (Pre GST) Rs 314 (Post GST)

- 1) Calculate the percentage difference in ticket prices of Inox (R city) in Morning and evening show of URI.

- 2) Calculate average ticket price for the morning show of URI?

- 3) Which theatre is selling most expensive ticket for morning show of URI?

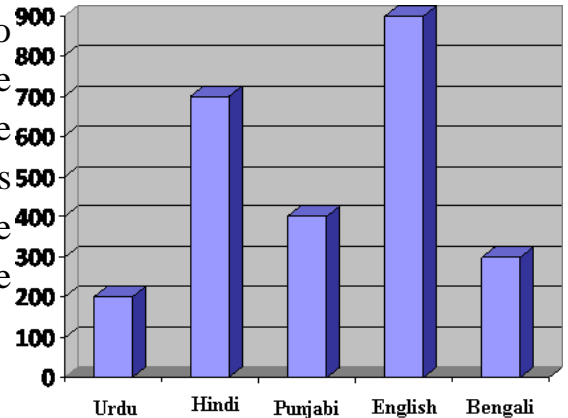


**Challenge
Yourself...**

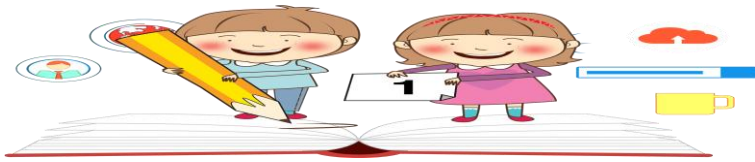


NEWSPAPER- UNITES INDIA

Reading newspaper is a very useful activity to start your day this gives you a brief knowledge into real happenings in the country & around the world. This bar graph shown in figure represents the circulation of newspaper in a town in five languages. Study the bar graph and answer the following questions:



- 1) What is the total number of newspapers published in Hindi, English, Urdu, Punjabi and Bengali?
 - a) 2400
 - b) 2500
 - c) 2600
 - d) None of these
- 2) What will be the mean number of newspapers among all 5 languages displayed in graph?
 - a) 525
 - b) 495
 - c) 490
 - d) 500
- 3) How many newspapers should be increased of Urdu to increase the mean by 100?
 - a) 300
 - b) 400
 - c) 500
 - d) 600



**Challenge
Yourself...**



FIT INDIA MISSION



Aashima is a fitness freak; she goes for walk all 7 days of a week. She follows the following routine:

- Exercise Daily for at least an hour.
- Eat the Right Foods and Portion Each Meal.
- Keep Track of Calories and Food Intake Per Day.
- Be Sure to Get Sleep.
- Stay Motivated.

She follows a fitness app to track her daily workout in terms of following parameters:

1. Steps Counted
2. Daily Set Goal
3. Miles Covered
4. Calories Lost
5. Time

Following image shows her today's workout statistics based on it answer the questions given below:





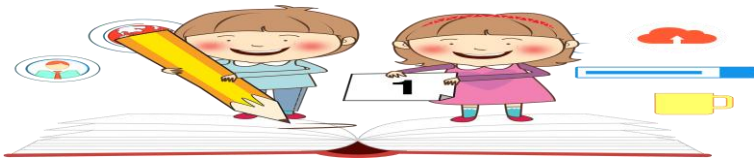
Challenge
Yourself...



1. Aashima has set a target to work for 80 min every day. But today she walked for 48 min only. Calculate the steps left for her to complete to meet her Goal?

2. On a cheat day she decided to go out and have a meal containing 1 cheese burger, 1 French fries and a cola. Based on her calories intake calculate the number of steps she needs to walk next day to overcome this cheat diet. Use her pedometer scale for your calculations.



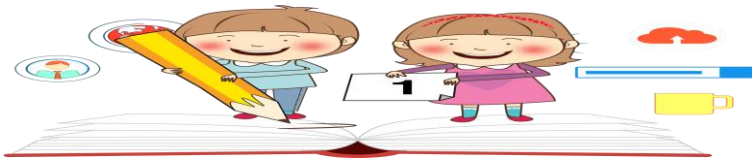


Challenge
Yourself...



3. On completion of 1 year anniversary of fit India movement Aashima decided to complete a walking trail to Mata Vaishno Devi shrine temple. One walking trail to Mata Vaishno Devi shrine is about 14 kilometres long. Walkers need to return from the 28 km walk within 16 hours. Aashima estimates that she can climb the temple at 2.5 kilometres per hour on an average, and can come down at twice that speed. These speeds take into account meal breaks and rest times. Using Aashima's estimated speeds, what is the latest time she can begin her walk on Monday so that she can return by 5 p.m.?

4. Aashima wore a pedometer to count her steps on her walk along the walking trail. Her pedometer showed that she walked 28,000 steps on the way up. Estimate Aashima's average step length for her walk up the trail. Give your answer in centimeters (cm).



**Challenge
Yourself...**



PLAY WITH MEAN

The mean is the average of the numbers. It is easy to calculate: add up all the numbers, then divide by how many numbers there are. In other words it is the sum divided by the count.

Example 1: What is the Mean of these numbers?

6, 11, 7

Add the numbers: $6 + 11 + 7 = 24$

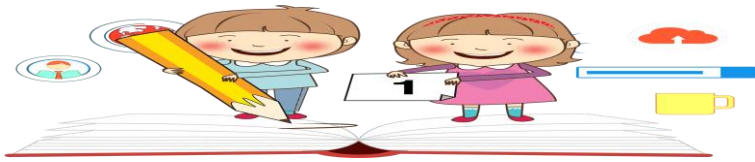
Divide by *how many* numbers (there are 3 numbers): $24 / 3 = 8$

The Mean is 8

- 1) If the mean of the five observations is 15. Then what will be the sum of all observations?

- 2) If the mean of first three observations is 14 and that of last three is 17, then find the third observation.

- 3) If all the five observations are increasing by 3, how the mean will change?



**Challenge
Yourself...**



AGE OF FAMILY

Teacher organized an activity to calculate median age of the family and defined it as-

**AGE OF FAMILY =
MEDIAN OF ALL AGES
OF FAMILYMEMBERS**



Ashok collected data of ages of his family members which is tabulated as bellow:

FAMILY MEMBERS	AGE
Ashok's Father	59
Ashok's Mother	48
Ashok's Uncle	51
Ashok	35
Ashok's wife	31
Ashok's Brother	32
Ashok's sister in law	30
Ashok's elder sister	25
Ashok's younger sister	19

- 1) What will be the median age (in years) of his family?
- 2) Later Ashok replaces the age 25 of his elder sister with his maternal Uncle's age 52. What will be the new median?

7



**Challenge
Yourself...**



A STUDY ON POND

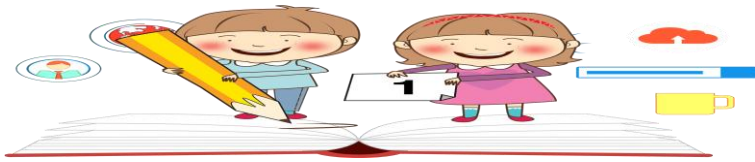


A study was done on the weights of different types of fish in a pond. A random sample of fish were caught and marked in order to ensure that none were weighed more than once. The sample contained 150 largemouth bass, of which 30% weighed more than 2 pounds.

1. Which of the following conclusions is best supported by the sample data?
 - a) The majority of all fish in the pond weigh less than 2 pounds.
 - b) The average weight of all fish in the pond is approximately 2 pounds.
 - c) Approximately 30% of all fish in the pond weigh more than 2 pounds.
 - d) Approximately 30% of all largemouth bass in the pond weigh more than 2 pounds.

Based on above conclusions choose the correct option:

- 1) Both a and b 2) both b and c 3) both a and d 4) only option d




























**Challenge
Yourself...**



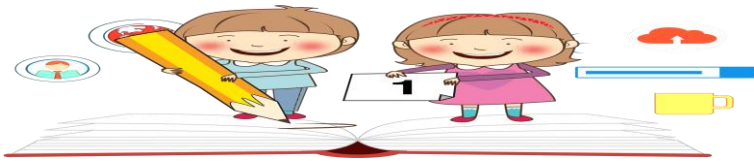
100 METER RACE

In the table below, women's times for a 100 meter sprint have been recorded for various countries.



Observation	Country	Country	Women 100 m Sprint Time
1		America	9.7
2		America	10.1
3		America	9.9
4		America	11.1
5		America	9.6
6		Canada	11.8
7		Canada	10.4
8		Canada	11.3
9		Canada	10.0
10		Canada	10.5
11		Jamaica	9.5
12		Jamaica	9.5
13		Jamaica	9.3
14		Jamaica	10.0
15		Jamaica	11.2
16		France	9.9
17		France	9.9
18		France	10.9
19		France	10.6
20		France	9.0
21		Nigeria	9.7
22		Nigeria	10.4
23		Nigeria	9.5
24		Nigeria	9.9
25		Nigeria	11.4

(This is a fictitious data set, meant for instructional purposes only.)



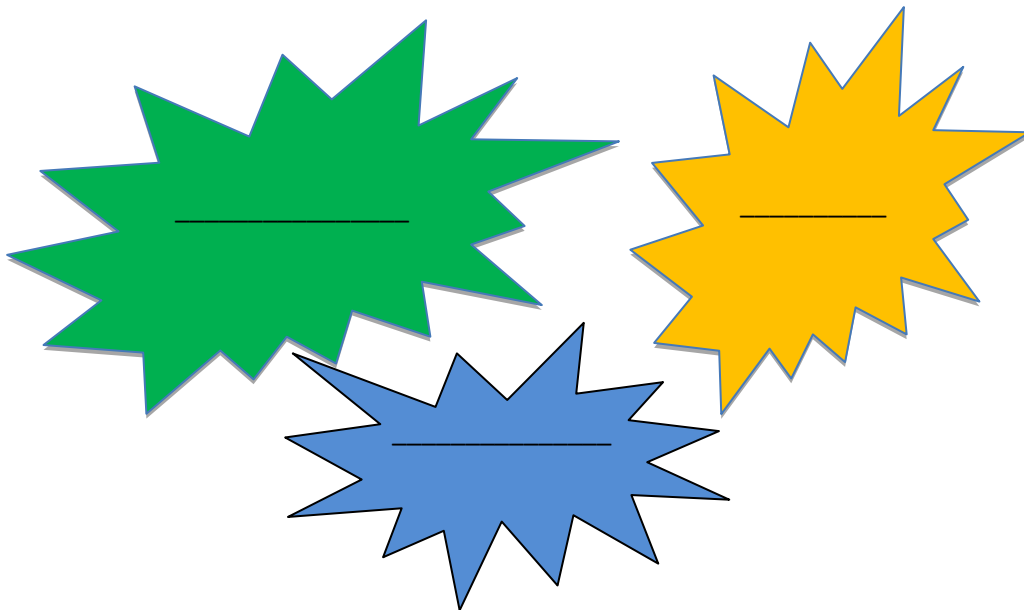
Challenge
Yourself...

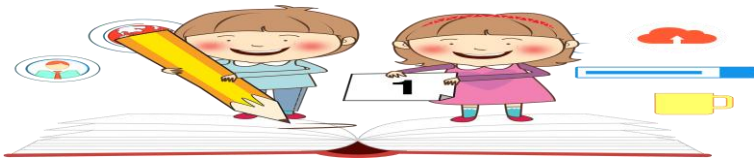


- 1) Find the average time of each country. On basis of trend which country has maximum sprint time and which has minimum?

- 2) What is the average sprint time for all the countries?

- 3) Name the countries which have higher average sprint time than average for all the countries?





**Challenge
Yourself...**



DICE GAME

Make 10

Asha and Lata are playing a game of making 10 with pair of dices. The game is as follows:

Step 1: Two dice are rolled.

Step 2: Player will add the numbers obtained on the two dices.

Step 3: Now finds the number that needs to added or subtracted to make a 10. This added/subtracted number is the score of the player.

Player with greater score is the winner.

If Asha rolled the pair of dices first, she got the numbers 6 and 1.

So $6 + 1 = 7$

To make 10 we needed 3 added to the sum
i.e $7 + 3 = 10$

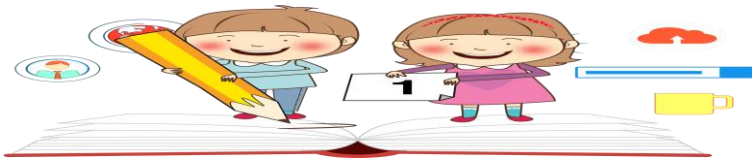
Thus Asha's Score is 3.



- 1). Now, In the game of MAKING 10, what is the Probability that Lata wins the game?

- 2) What is the probability that Asha Scores 10 marks?

- a) 1 b) $\frac{1}{12}$ c) 0 d) $\frac{1}{6}$



**Challenge
Yourself...**

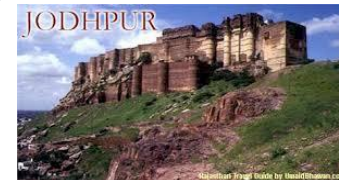
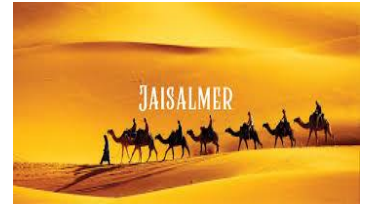


VACATIONTOUR

Veena plans to spent summer vacations in four cites- Jaipur, Jodhpur, Jaisalmer and Bikaner. She has not decided any order of visiting these cities.

1) What is the probability that she visits

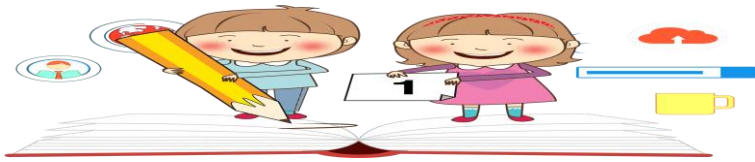
(i) Jaipur before Jodhpur



(ii) Jaipur before Jodhpur and Jodhpur before Jaisalmer

(iii) Jaipur first and Jodhpur last.

2) She first visited Jaipur and then other cities. What is the probability that she visited Jaisalmer in the last?

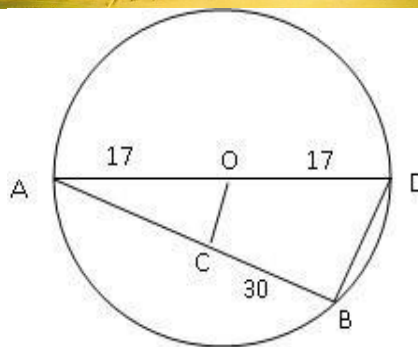


**Challenge
Yourself...**



MULTI-CULTIVATION FARMING

A farmer has a circular piece of land of radius 17m. Looking at the rising prices of the fruits and vegetables, he plans to grow few of them and for it he first divides the land into two equal halves and uses one half to grow vegetables. Other half is further divided into two parts by drawing a line AB using one of the end points of the first half and drawing a chord to this portion to grow fruits in the one part and flowers or medicinal plants in the other parts. If the length of the AB is 30m.



- 1) What is the distance of this dividing line (chord) from the center?

i) 5m
ii) 7m
iii) 8m
iv) 9m
- 2) What is the area of the land where he grows vegetables?

i) 454 sq. m (approx.)
ii) 464 sq. m (approx.)

iii) 554 sq. m (approx.)
iv) 564 sq. m (approx.)
- 3) List down real life objects containing tangents, secants and chords around you.

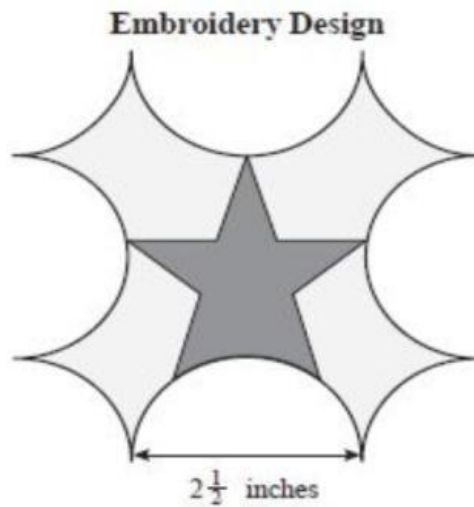


**Challenge
Yourself...**



SCHOOL EMBLEM

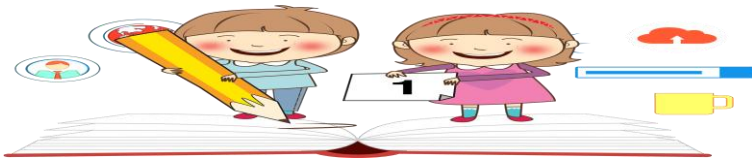
Alisha was asked to design an emblem for her school. After working on many ideas and designs, she finally settled on the following design. The perimeter of the design is made by alternating semicircle and quarter-circle arcs. Each is formed from a circle with an $2\frac{1}{2}$ inch diameter. There are 4 semi-circle and 4 quarter circle arcs, as shown in the diagram below.



She wants to put golden wire on the outer boundary of the design. To calculate the length of the wire required

- 1) What will the length of the wire required?

- 2) What is the minimum length of square sheet required to cut out this design so that the wastage is minimum

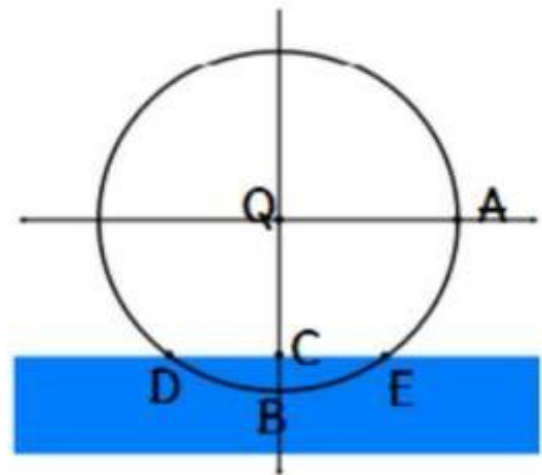
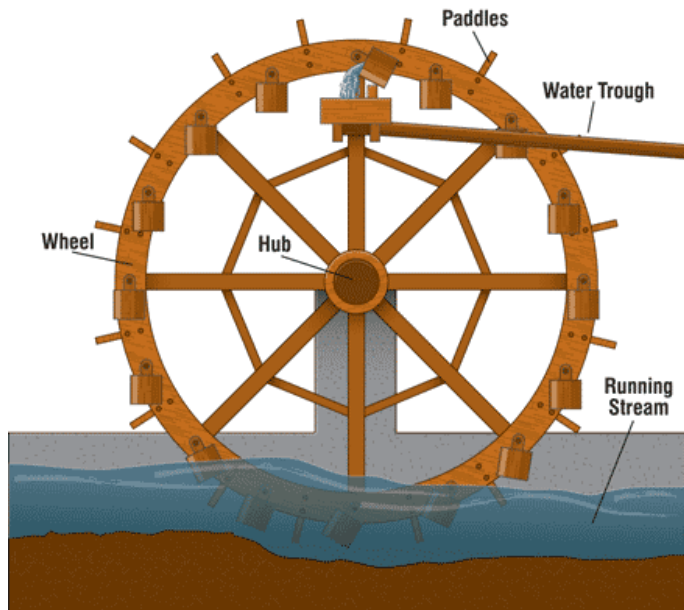


Challenge
Yourself...



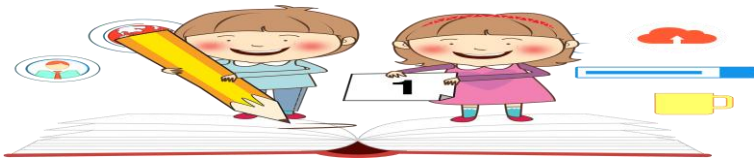
WATER WHEEL

Waterwheels are used in many countries for generating power from water. One such wheel is shown here in the figure. Raju had one such wheel in his village and after studying about this water wheel as a power generator, he got more curious to know about its working. He went to the river and observed the following:



The 24 feet diameter water wheel reaches 3 feet below water level and takes 10 seconds to complete one rotation. He drew the same on a coordinate plane with the centre of the wheel at the origin.

- 1) If the wheel works for 8 hours in a day, how many rotations does it make in all
 a.) 2750 b.) 2880 c.) 2300 d.) 2560
- 2) If $\angle DQE = 60^\circ$, what length of the wheel remains immersed in water?

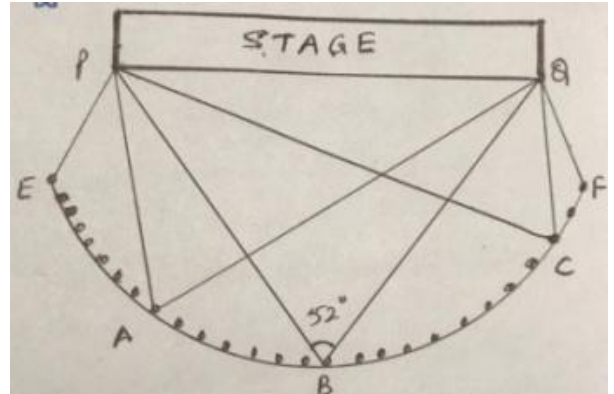


Challenge
Yourself...



THEATERPLAY

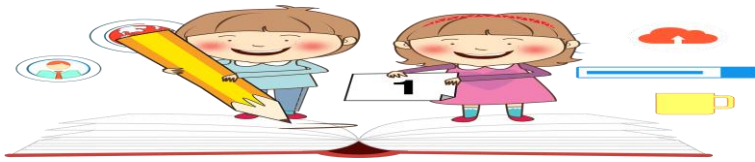
Preeti plans to watch a play with her friends in the nearby theatre. While booking the seats online, she observes that the seats in the theatre are arranged in the shape of an arc of a circle as shown in the figure from point E to point F. She observes that the angle of viewing from Point B is 52° . But the seats nearby this Point B are booked. So she decides for the seats near Point A or Point C.



- 1) Can you help her find out the angle of viewing at point A and Point C?
a) 25° b) 35° c) 52° d) 34°

- 2) Which concept related to circles is used here?

- 3) In a theater there are 1840 people watching play, out of which 63 % are Women. Find out the number of women watching play.
a) 1160 b) 1159 c) 1145 d) 1158



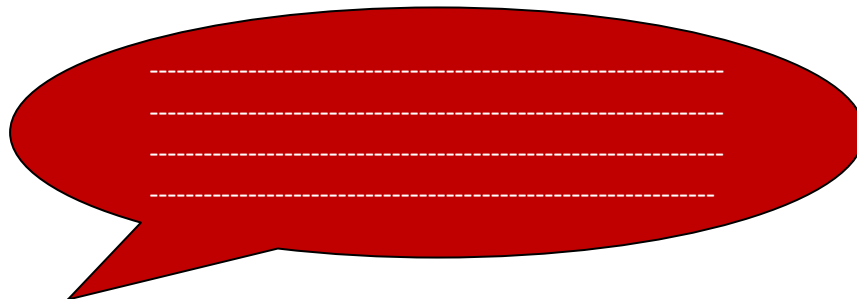
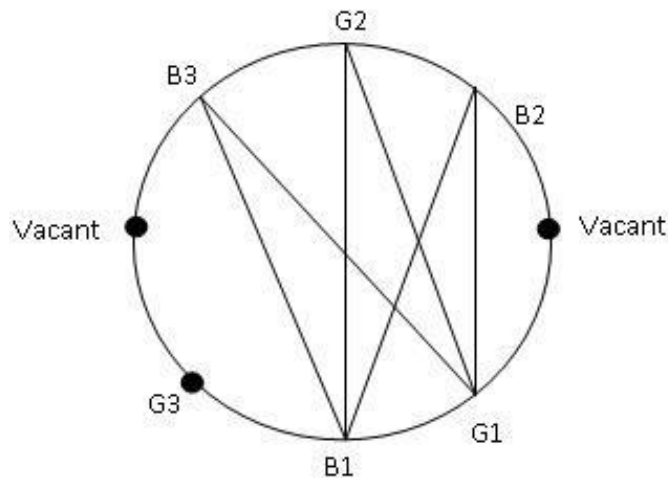
Challenge
Yourself...



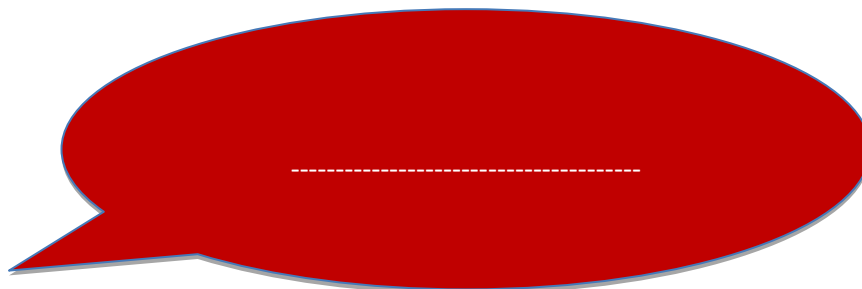
SEATING ARRANGEMENT

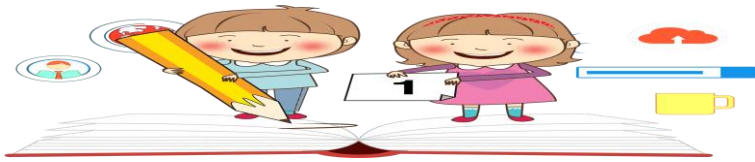
In an interstate conference, 3 girls and 3 boys were representing their respective states. The officials made them sit on a circular table with 8 seats, alternatively for a discussion on a certain topic. The arrangement is depicted by the diagram given. If $\angle B_1G_2G_1 = 40^\circ$

- 1) Find the angle between Boy1, Boy3 and Girl1



- 2) Name the participants sitting at equal angles w.r.t participants $B_1B_3G_1$



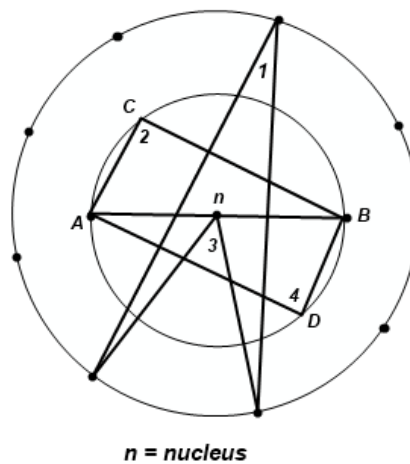


**Challenge
Yourself...**



ELECTRONIC CONFIGURATION

In a chemistry class, the teacher was explaining the electronic configuration of element Neon (at. No=10). She made the pictorial representation of one atom of Neon on the blackboard. The small dots representing the electrons in the circular orbital. A student integrated this topic with the concept of concentric circles.



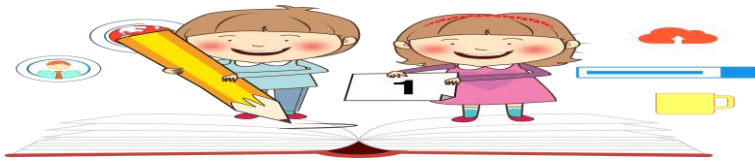
If $\angle 1 = 20^\circ$

- 1) Determine the angle formed by two consecutive electrons of the outer Orbital at the nucleus of the atom.

- 2) Also, if AB acts as the diameter of the inner circle and C & D are any Two points in the boundary, find $\angle 2$.

- 3) Also, find $\angle 4$.

- 4) What can you say about all such angles in a semi-circle?

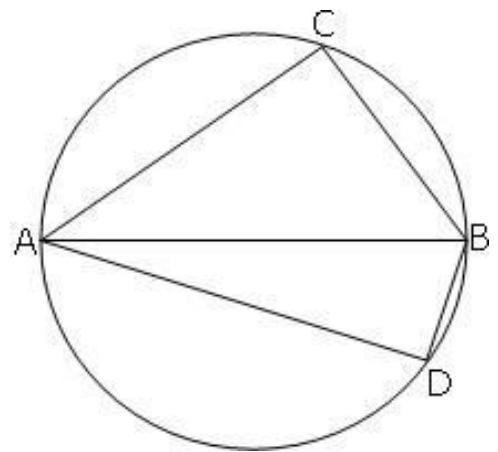
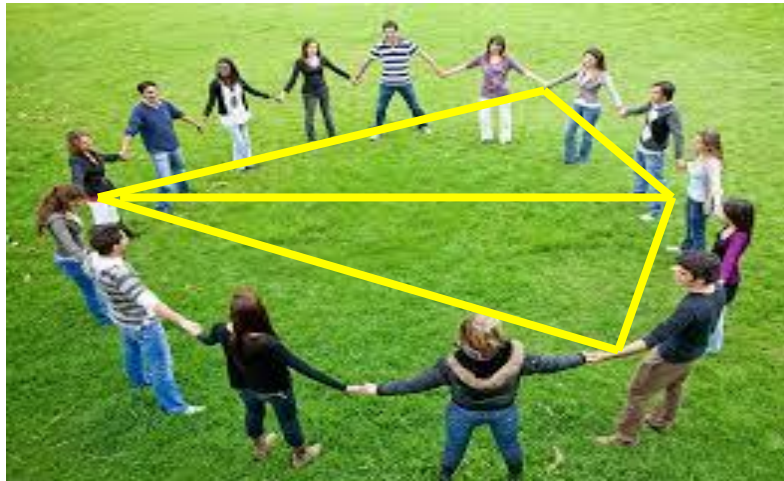


**Challenge
Yourself...**



CHILDREN'S PARK

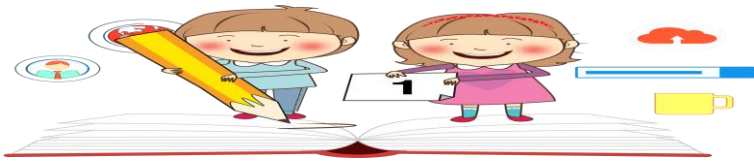
A rich man donated a circular piece of land of diameter 25m to an orphanage Centre. The deciding committee of orphanage Centre planed a quadrilateral shaped park inside that circular portion as shown in the figure, where the side AC is 20m and BD is 7m. They planned to keep the area of triangle ADB for different swings, slides, see saw etc. and the area of triangle ACB to play different types of games



On the basis of above information, answer the following questions:

- 1) Find the area of the land which is planned for different types of swings, slides etc.

- 2) Find the area of the land which is planned for playing different games.



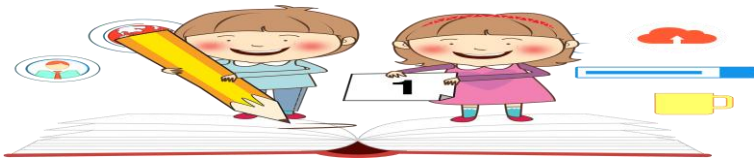
**Challenge
Yourself...**



- 3) If the committee wants to make some seating arrangement in rest of the portion of the circular land, how much area is available for making this arrangement?

- 4) A sprinkler at the Centre of the land can cover an area of 500m^2 .
Will the sprinkler water the entire land?

- 5) Find the cost of fencing the quadrilateral shaped land at the rate of Rs300 per meter.



**Challenge
Yourself...**



THE TOWER BRIDGE OF LONDON

Built between 1886 to 1894, the Tower Bridge is one of the most recognizable structure in London, England. Inside the towers are engines that allow the central span to be raised, allowing river traffic to flow through unimpeded. The bridge's two towers are tied together near the top by two walkways which help the bridge remain stable.

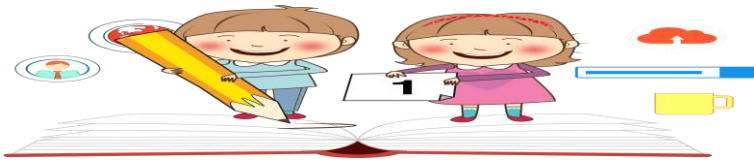
Tower Bridge has a mechanism to split the surface and lift them through Hydraulic pressure mechanism to allow the ships to pass through them.



When it opens it Splits the road into two equal halves and creates a triangular shape with the previous baseline of the road on it. The length of the portion of road between two towers is approximately 60 m.



The clearance below the bridge is nearly 9 m.



**Challenge
Yourself...**



Answers Following questions based on given information.

1) **Answer below questions as True/False**

- (i) The clearance under below the bridge is approximately 900 cm.

- (ii) As shown in figures above when the gates open it creates an equilateral Triangle.

- (iii) The difference between length of Road between towers and clearance under The bridge is 51000 mm.

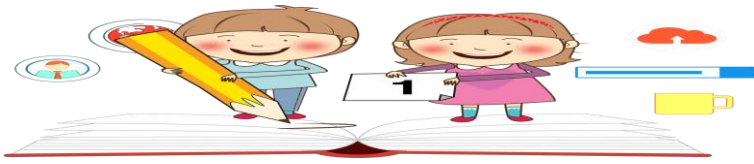
2) **Fill in the blanks.**

- (i) The Road when opens to allow ships to pass under it splits it into two _____ Halves.
- (ii) The two towers on bridge are _____ to each other.
- (iii) Under the bridge the clearance Area is of _____ shape.

Choose one correct answer:

- 3) What is the Area of the Triangle formed when gates are open if each of the two slanting sides of triangle is 40 m as shown in first picture?

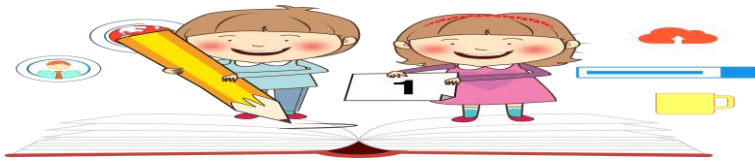
- (i) $280\sqrt{7}\text{m}^2$
- (ii) $300\sqrt{7}\text{m}^2$
- (iii) 2100m^2
- (iv) $210\sqrt{7}\text{m}^2$



**Challenge
Yourself...**



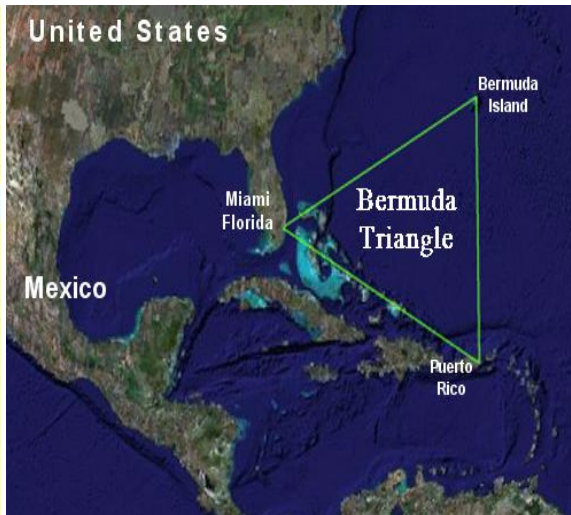
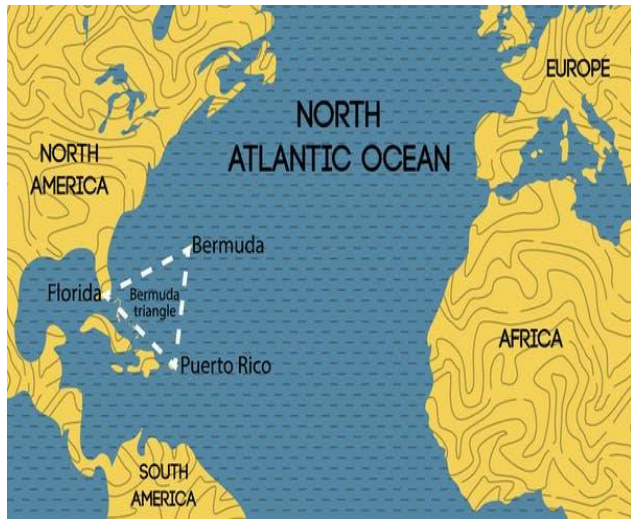
- 4) What is ratio between the area of triangle formed and the area of rectangular clearance under the bridge?
- (i) 35:9
 - (ii) $5\sqrt{7} : 9$
 - (iii) $14\sqrt{7} : 27$
 - (iv) $7\sqrt{7} : 18$



Challenge
Yourself...



MYSTERY OF BERMUDA TRIANGLE



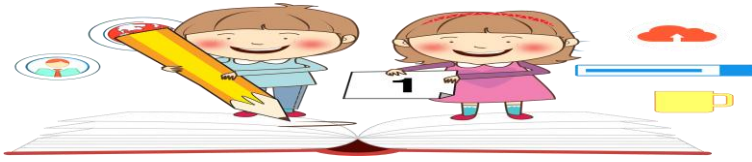
The story of what we call the “Bermuda Triangle” actually began 56 years ago, in 1964. The name was first used by American author Vincent Gaddis in Argosy magazine, to describe an area the shape of a triangle in the Atlantic Ocean, off the coast of Florida. The hype around the Bermuda Triangle can be traced back to a series of unexplained disappearances of ships and aircraft. In 1945, five US Navy planes and 14 men disappeared in the area while doing routine training exercises.

The approximate distance between Miami Florida and Bermuda is approx. 1030 miles and between Miami and Puerto Rico is 1010 miles also distance between Puerto Rico and Bermuda Triangle is approx. 1600 miles.

1) By taking all distances rounded off to nearest multiple of 100, Find the

Approximate area of Bermuda triangle?

(i) 450000 sq. mile (ii) 340000 sq. mile (iii) 480000 sq. mile (iv) 540000 sq. mile



Challenge
Yourself...



2) Answer as True/False

- (i) Considering distances rounded off to nearest multiple of 100 .The Bermuda Triangle is an isosceles triangle.

- (ii) Conversion rate is 1 mile is approximately equal to 1.6 Km.

- 3) “The story of what we call the “Bermuda Triangle” actually began 56 years ago, in 1964. The name was first used by American author Vincent Gaddis in Argosy magazine”. In this statement the year mentioned .Is it a leap year? Show working in support of your answer.



Challenge
Yourself...



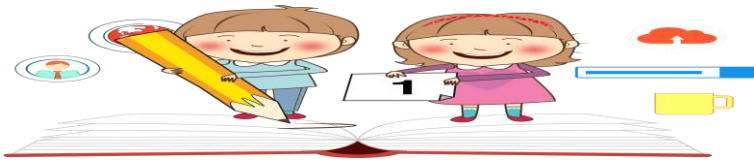
THE GLASS PYRAMID MUSEUM

The **Louvre Pyramid** (Pyramide du Louvre) is a large glass and metal pyramid designed by Chinese-American architect I. M. Pei, surrounded by three smaller pyramids, in the main courtyard (Cour Napoléon) of the Louvre Palace (Palais du Louvre) in Paris. The large pyramid serves as the main entrance to the Louvre Museum. Completed in 1989, it has become a landmark of the city of Paris. The pyramid used as an entrance in the Louvre's courtyard has the exact same proportions as the **Great Pyramid of Giza**.



The structure, which was constructed entirely with glass segments and metal poles, reaches a height of 21.6 meters (71 ft.). Its square base has sides of 34 meters (112 ft.) and a base surface area of 1,000 square meters (11,000 sq. ft.)

- 1) If we consider a similar structure with each triangular side perimeter 600 m. Sides in ratio of 5:12:13. Find total area of all 4 sides of pyramid.



**Challenge
Yourself...**



- 2) If the smaller Pyramid inside the structure mentioned in part (a) is $\frac{1}{20}$ of structure .Then the length of edges of each side will be:
- (i) 5m, 12m, 13m (ii) 12m, 13m, 9m
- (iii) 15m, 14m, 10m (iv) 20m, 15m, 10m

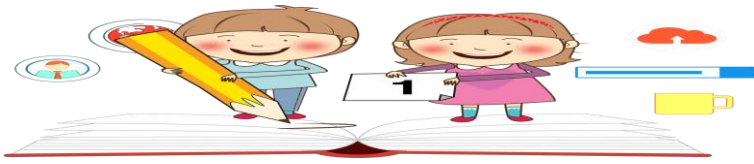
3) **Answer as True/False**

- (i) If p is the perimeter of the triangle of sides a,b,c ,the area of triangle is

$$A = \frac{1}{4} (\sqrt{p(p-2a)(p-2b)(p-2c)}) .$$

- (ii) If each side of the triangles is tripled, the area will become 9 times.

- (iii) Heron formula for area of triangle is not valid of all triangles.



**Challenge
Yourself...**



ANSWER KEY

FITNESS CHALLENGE

1) 3 days 2) (a)

PIZZA PIE

1) (d) 2) 4.88 or 4.9

CORONA VIRUS PREVENTION

1) 66.67% 2) 150% 3) ₹ 22.80

SCHOOL SURVEY

1) Bus 2) 53 3) 24

BIRTH RATE

1) 14.57 births per 1000 people 2) (d)

BAKER'S SHOP

1) (a) 2) Rs 20,000

FOOTBALL FIELD

1) d 2) Ordinate of R = 73 3) d

DISTANCE

1) 5km 2) $2\sqrt{2}$ km or 2.828 km

BOX OFFICE

1) (a) 2) b 3) c

RIDE AT DOORSTEP

1) Rs15 2) Rs30 3) a



**Challenge
Yourself...**



MATHS OLYMPIAD

1) 82 2) 32 3) 14) 0.25

DEER PARK

1) 440 2) 575 3) 2025

BARCODE

1) c 2) b

TOP GEAR

1) 15 2) CA

MOBILE BATTERY

2.5 hours. ($70 - 20 = 50\%$, $50 - 25 = 25\%$, $25 / 10 = 2.5$ hrs.)

BIRTHDAY AT PARK

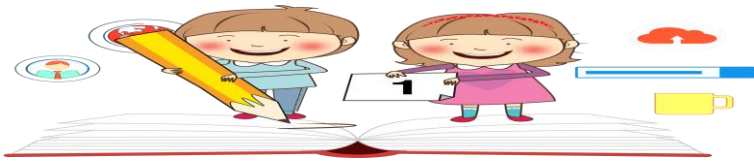
- 1) a) 60° b) 90° , they are standing perpendicular to each other
2) 30°
3) 110°

CHILDREN DAY CELEBRATION

- i. 45° , opposite sides are parallel.(open ended question , student can explore other ways to distribute)
ii. $1:1:\sqrt{2}$; sides of isosceles right-angled triangle.
iii. $18\sqrt{2}$ cm

FRIENDSHIP DAY

1) (c)2) (d)



**Challenge
Yourself...**



LEPCHA: A TRADITIONAL HOUSE

1. a) 120° 2. d) All of these 3. c) 100°

MATHEMATICS IN DESIGNING

- 1) 65° 2) $x+y+z=180^\circ$ 3) $z=70$

DESIGNING GARDEN

1. $\frac{1}{2}$ 2. B 3. c

PLAYING

1. 360 2. $\sqrt{3} \text{ m}^2$

SIMILARITY AND CONGRUENCE

1. 7.68m 2. 1600 feet

CRAFT MELA

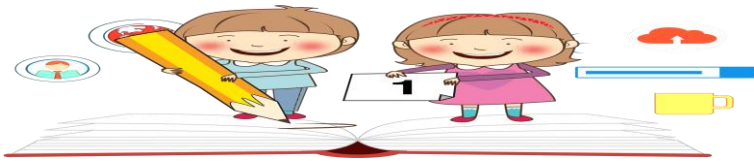
1. Rectangle
2. Because perimeter of a rectangle is less than that of a parallelogram.
3. $BE = 8 \text{ m}$

OLD AGE HOME

1. Yes
2. i) b) Triangle and Parallelogram on same base and between same parallel,
Area of triangle will be half the area of parallelogram.
- ii) 450 m^2

MY TEACHER

1. $AB \parallel HC \parallel GD \parallel FE$ and $BC = CD = DE$



**Challenge
Yourself...**



$$AH = HG = GF$$

(Given three parallel lines making equal intercepts on any transversal then they will make equal intercepts on other transversal also)

$$AF + FE = 18 + 12 = 30 \text{ cm}$$

2. Three type of quadrilaterals can be formed

3. Rectangle, parallelogram, kite

DOLL HOUSE

1. By joining the diagonals of the rectangular part will be divided into 4 equal parts. Area of each part will be 125 m^2

2. Yes the cost will be more.

$$3. (160 + 500) \times 30 = \text{Rs } 1980$$

BEST OUT OF WASTE

$$1. 616 \text{ cm}^2$$

$$2. \text{Rs. } 462$$

$$3. 1000 - 612 = \text{Rs. } 388$$

4. NO, as she is left with Rs. 388 only, less than Rs. 462

AFTER COVID: BACK TO SCHOOL

$$1.) (4, -1)$$

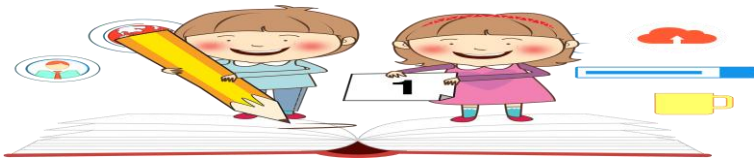
$$2.) 5 \text{ units}$$

$$3.) 8 \text{ units}$$

ROHTANG TUNNEL

$$1. d) 69300 \text{ m}^3$$

$$2. a) ₹1732500$$



**Challenge
Yourself...**



3. a) 9900 m^2

POOL TIME

1. d) 10 cm

2. a) ₹15750

3. a) 110000

SAIL BOAT

1. 4926 m^2

2. 67.8 m^2

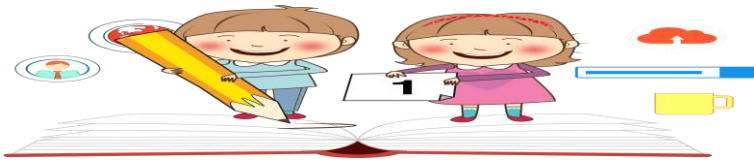
THE QUADRILATERAL FAMILY TREE

1)

1. True
2. True
3. False
4. False
5. True
6. True
7. False
8. False

2)

A) ₹ 3348



**Challenge
Yourself...**



B)

Area of plastic sheet = $\frac{1}{2}(\text{sum of parallel sides}) (\text{distance between them})$

$$= \frac{1}{2} (10+5) (6)$$

$$= 45 \text{ m}^2.$$

SEEPAGE

- 1) 12.5 litres
- 2) 240 sq cm

SPEED GUN

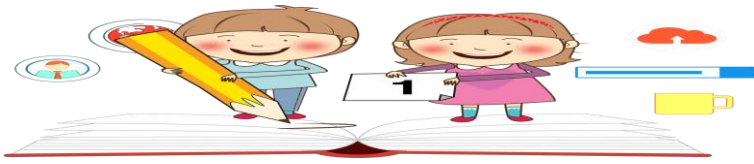
- 1) Vehicle C, E, F and H
- 2) 87.5
- 3) 78 km/h
- 4) $78 - 74.88 = 3.12$, Mean will decreased by 3.12

BATTING AVERAGE

- 1) 175.75
- 2) $217 - 32 = 185$
- 3) 32.24
- 4) ODI format

SIBILING SURVEY

- 1) Median number of siblings = 1



**Challenge
Yourself...**



Explanation: total students surveyed= $300+300=600$

Median = $(600/2) = 300^{\text{th}}$ observation

Value 0 occurs $80+100=180$ times

Value 1 occurs $80+110=190$ times

Total observation made till 1 is 370 hence median is 1.

2)Median number of siblings=2

Explanation: total students surveyed= $220+200=420$

Median = $(420/2) = 210^{\text{th}}$ observation

Value 1 occurs $80+110=190$ times

Value 2 occurs $60+30=90$

Total observations made till 2 are 280 hence median is 2.

LET'S WATCH A MOVIE –

1)56.05%

2)144.6

3)PVR (JUHU)

NEWSPAPER- UNITES INDIA

1)b

2)d

3)c



**Challenge
Yourself...**



FIT INDIA MISSION

1. Steps covered in 48 min = 7474

Steps covered in 1 min = $7474 / 48 = 155$

Steps covered in 80 min = $155 \times 80 = 12456$

Now, Target = 12456

Steps covered = 7474

Steps left = $12456 - 7474 = 4982$

2.1 Cheese burger = 354 cal

1 French fries = 340 cal

1 cola drink = 187 cal

Total calories consumed = $354 + 340 + 187 = 881$ calories

Now,

For loosing 281 calories she walk = 7474 steps

For loosing 1 calorie she walk = $7474 / 281 = 26$ steps

For loosing 881 calories she has to walk = $26 \times 881 = 22906$ steps

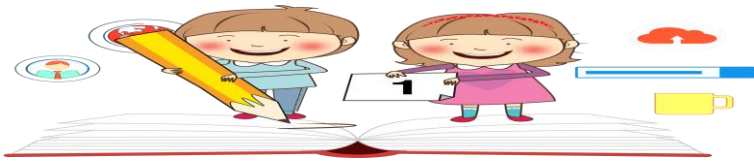
3.

8:36 a.m. (approx.)

Time taken uphill = $\frac{\text{Distance}}{\text{speed}} = \frac{14}{2.5} \text{ h} = 5.6 \text{ hours}$

Time taken downhill = $\frac{14}{5} \text{ h} = 2.8 \text{ hours}$

Total time taken = $(5.6 + 2.8) \text{ h} = 5.6 \text{ and } 2.8 = 8.4 \text{ hours (approx.)}$



**Challenge
Yourself...**



Hence, Aashima took 8 hours and 24 minutes to reach by 5 p.m. So, she must start by 08:36 a.m.

as- 5 p.m. can be written as 17:00 in 24-hour format. So, we need to subtract 17:00 and

08:24.

Hours Minutes

$$17\ 00 - 08\ 24 = 0836$$

4. 50 cm

$$\text{Average step length} = \frac{\text{Total distance}}{\text{total number of steps}} = \frac{14 \times 1000 \times 100}{28000} = 50 \text{ cm}$$

PLAY WITH MEAN-

- 1) 75
- 2) 9
- 3) Mean also will increase by 3

AGE OF FAMILY-

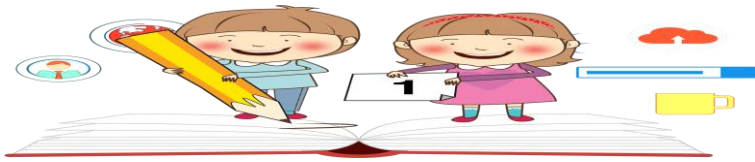
- 1) Median age = 32 years
- 2) New median age = 35 years

A STUDY ON POND-

1. Option 4

100 METER RACE

- 1) Mean of each country =



**Challenge
Yourself...**



America	10.1
Canada	10.8
Jamaica	9.9
France	10.1
Nigeria	10.2

Maximum-Canada

Minimum-Jamaica

2) Mean =10.2

3) Canada Only

DICE GAME -MAKE 10

1) 5/12

2) C

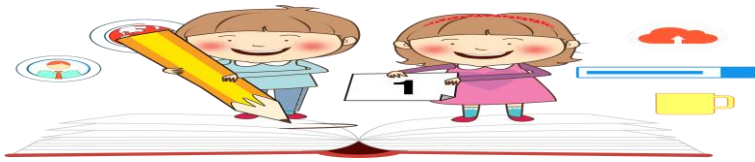
VACATION TOUR

Q1) $1) 12/24 = \frac{1}{2}$

2) $4/24 = \frac{1}{6}$

3) $2/24 = \frac{1}{12}$

Q2) $2/6 = \frac{1}{3}$



**Challenge
Yourself...**



MULTI-CULTIVATION FARMING

- 1) 8m
- 2) 454 sq. m
- 3) Any real life examples

SCHOOL EMBLEM

- 1) Length of wire $6\pi r$ or 23.57 inches
- 2) Minimum length of square sheet = $2\frac{1}{2} + 2\frac{1}{2} = 5$ inches.

WATER WHEEL

i) 10 seconds to complete 1 rotation

In 8 hours, no. of rotations $\frac{8 \times 60 \times 60}{10}$

$$= \frac{28800}{10}$$

= 2880 rotations

- ii) Length of wheel in water = $\frac{1}{6}$ of circumferences

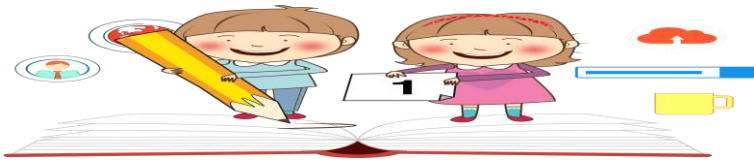
$$\frac{1}{6} \times 2 \times \frac{22}{7} \times 12 = 12.56 \text{ feet}$$

THEATER PLAY

- i) $\angle PAQ = \angle PBQ = \angle PCQ = 52^\circ$

This means that the theatre has been designed in way that the viewing angle will remain the same irrespective of the seat taken up. So she can go for any of the seats near A or C.

- ii) Angles in the same arc of a circle are equal



**Challenge
Yourself...**



iii) 1160

SEATING ARRANGEMENT

1) $B_1B_3G_1 = 40$ degrees

2) $B_1B_2G_1$

ELECTRONIC CONFIGURATION

1. $\angle 3 = 40$ degree

2. $\angle 2 = 90$ degree

3. $\angle 4 = 90$ degree

4. 90 degree each

CHILDREN'S PARK

a) 84m^2

b) 150m^2

c) 257.07 m^2

d) As the area of circle is 491.07, therefore, sprinkler can water the whole land.

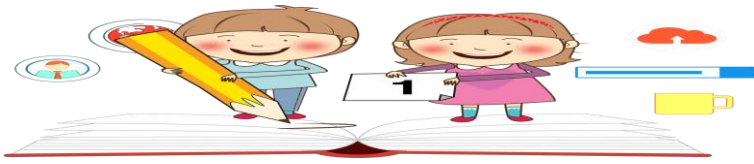
e) Rs 19800

THE TOWER BRIDGE OF LONDON

1) (i) True

(ii) False

(iii) True



**Challenge
Yourself...**



- 2) (i) Equal
(ii) Parallel
(iii) Rectangular

3) $300\sqrt{7} \text{ m}^2$

4) $5\sqrt{7} : 9$

MYSTERY OF BERMUDA TRIANGLE

- 1) (iii) 480000 sq. miles
2) (i) True
(ii) True
3) Yes, as 1964 is divisible by 4.

THE GLASS PYRAMID MUSEUM

- 1) 12000 m^2
2) (i) 5 m, 12m, 13m
3) (i) True
(ii) True
(iii) False

Credits:

Coordinators:

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- Mr. Rajeev, Principal GMSSS-22, Chandigarh
- Ms. Rajeesvari (KVS, ZIET, Chandigarh)

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CRITICAL AND CREATIVE THINKING (CCT)

Resource Material Developed

Mathematical Literacy

- 4 modules (classes 7 to 10) in English and Hindi medium
- 'Step by Step' Mathematics Booklet Series
- 'Mathlete' fortnightly series
- CCT Booklets for classes 8th, 9th and 10th (100 pages)

Scientific Literacy

- 5 Modules (classes 6 to 10) in English and Hindi medium
- 'Harshit /Joyful Learning' weekly series
- CCT Booklet for classes 8th -10th (100 pages)

Reading Literacy English

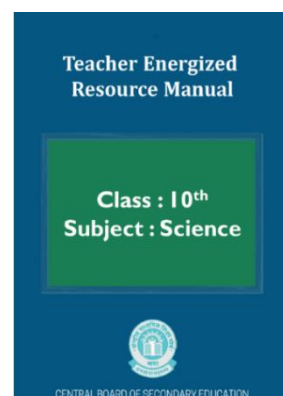
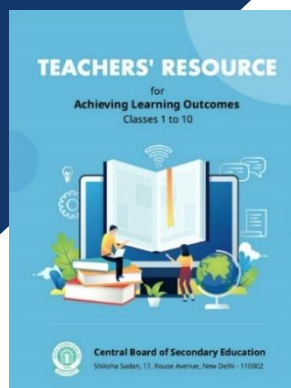
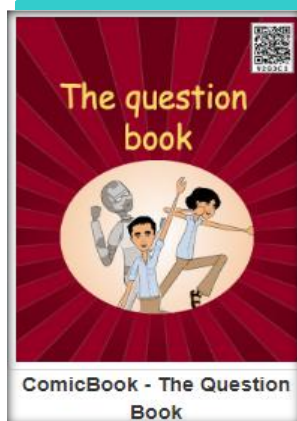
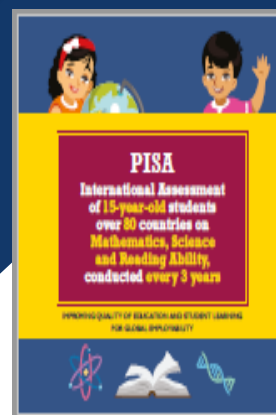
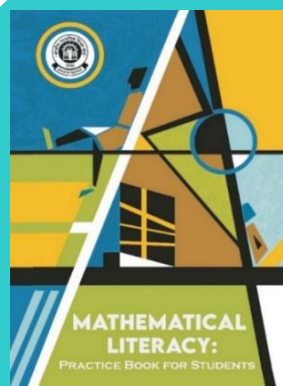
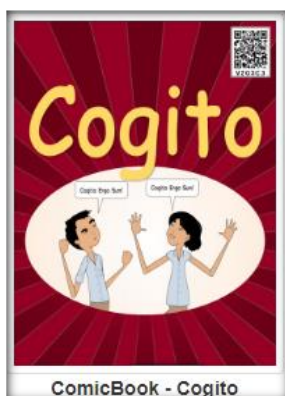
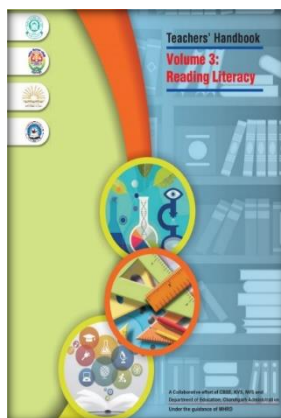
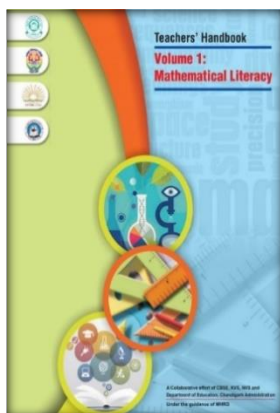
- 5 Handbooks/modules of Reading Literacy (classes 6 to 10)
- 3 Handbooks/modules of Reading Literacy for supplementary reader (classes 8 to 10)
- CCT Booklets for classes 8th, 9th and 10th (100 pages)

Reading Literacy Hindi

- 5 modules (Classes 6 to 10)
- 'Sankalp' Fortnightly Series
- Monthly CCT booklets for classes 6th- 8th and 9th-10th (January 2021 onwards)
- CCT Practice Booklets for classes 8th, 9th and 10th (100 pages)

CBSE Handbooks

- Vol.I Mathematical Literacy
- Vol.I Scientific Literacy
- Vol.I Reading Literacy
- Experiential Learning
- Joyful Teaching and Learning of Mathematics
- Art Integration
- Self-learning Resources
- Artificial Intelligence Integration Manual
- The Question Book
- Cogito
- 21st Century Skill Handbook
- Cyber Safety Manual
- Mathematical Literacy: Practice Book for Students
- PISA Primer
- Handbook of Joyful Learning



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