

Teacher's

Handbook of

Learning

Outcome

VII- Mathematics

Samagra Shiksha, Education Department, UT Chandigarh

FORWARD

Samagra Shiksha, Education Department, UT Chandigarh has prepared Teachers' handbook based on learning Outcomes at Elementary level in Hindi, English, Mathematics, EVS, Science & Social Science.

This Handbook will enable the teachers to ascertain learning skills more accurately in these subjects. While making the document it has been ensured that the learning need of the children with different learning level-pre Basic, Basic, Proficient & Advanced, are being catered & the academic progress of the students can be monitored by Faculty Incharges, Cluster Resource Coordinators & further by Head of the school.

The material in the document can be used as an assessment tool for Elementary classes & to keep a track of achievement of the learning level.

Teachers' handbook will not only help teachers to focus on teaching learning process but also facilitate State functionaries in their role towards ensuring quality education in schools

To make it user-friendly, simple language has been used as far as possible across the document. To help the teacher understand and achieve the learning outcomes as per the curricular expectations.

This document includes list of learning outcomes (with labeling) and progress sheet for monitoring/ tracking of the progress of the students.

Question prepared in this document are only suggestive for teachers. The teacher can modify these tools as per the need.

ABOUT THE DOCUMENT

This question bank might prove an effective tool in the hands of the educators & evaluators. It aims at assisting teachers to assess and improve the performance of the learners.

Some features of the documents are as follows:

- * Proper care has been taken to cover all the learning outcomes.
- * The questions have been framed focusing upon the learner's mathematical thinking, reasoning and hence ability to solve daily life problems.
- * The teacher can make relevant changes in question bank according to the needs of different levels of learners.
- * It provides enrichment material & remedial material for different level of learners.

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VII – MATHEMATICS

MONTH WISE BIFURCATION OF CHAPTERS AND LEARNING OUTCOMES [L.O.]

April	May	June	July	August	September	October	November	December	January	February	March
Chapter	Chapter			Chapter	Chapter	Chapter	Chapter	Chapter	Chapter		
1	3	SUMMER BREAK	5	8	EXAMINATION	9	11	12	13	REVISION	EXAMINATION
2	4		6	& Revision		10	15	14			
			7								
L.O	L.O		L.O	L.O		L.O	L.O	L.O	L.O		
1	19		12	9		5	17	8	6		
2	20		13	10		16	18				
3	21		14	11							
4	7	15									

Remarks : A little bit variation in achieving Learning Outcomes (Month wise) can be made according to convenience of the concerned teacher.

LEARNING OUTCOMES

1. Multiplies/divides two integers.
2. Interprets the division and multiplication of fractions for example interprets x as of y . Also \div is interpreted as how many make ?
3. Uses algorithms to multiply and divide fractions/decimals.
4. Solves problems related to daily life situations involving rational numbers.
5. Uses exponential form of numbers to simplify problems involving multiplication and division of large numbers.
6. Represents daily life situations in the form of a simple equation and solves it
7. Adds/subtracts algebraic expressions.
8. Distinguishes quantities that are in proportion. For example, tells that 15,45,40,120 are in proportion as $15/45$ is the same as $40/120$.
9. Solves problems related to conversion of percentage to fraction and decimal and vice versa.
10. Calculates profit/loss percent and rate percent in simple interest.
11. 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.
12. Verifies the properties of various pairs of angles formed when a transversal cuts two lines.
13. Finds unknown angle of a triangle when its two angles are known.
14. Explains congruency of triangles on the basis of the information given about them like (SSS, SAS, ASA, RHS) using ruler and a pair of compasses constructs, a line parallel to a given line from a point outside it and triangles.
15. Finds out approximate area of closed shapes by using unit square grid/ graph sheet.
16. Calculates areas of the regions enclosed in a rectangle and a square.
17. Finds various representative values for simple data from her/his daily life contexts like mean, median and mode.
18. Recognises variability in real life situation such as, variations in the height of students in her class and uncertainty in happening of events like throwing a coin.
19. Interprets data using bar graph such as consumption of electricity is more in winters than summer, runs scored by a team in first 10 overs etc.

PROGRESS SHEET

Name of the School Class VII (Mathematics)

Name of the teacher

Achievement level as per learning outcomes

(Grading :- A/B/C/D)

A- Beyond the expected standard

B- Approached the expected standard

C- Approaching the expected standard

D- not meeting the expected standard

Roll No.	Name of the student	APRIL				MAY				JULY				AUGUST		
		CH1	CH2			CH3			CH4	CH5		CH6	CH7	CH 8		
		LO1	LO2	LO3	LO4	LO19	LO20	LO21	LO7	LO12	LO13	LO14	LO15	LO9	LO10	LO11

PROGRESS SHEET

Name of the School Class VII (Mathematics) Name of the teacher

Achievement level as per learning outcomes

(Grading :- A/B/C/D)

A- Beyond the expected standard

B- Approached the expected standard

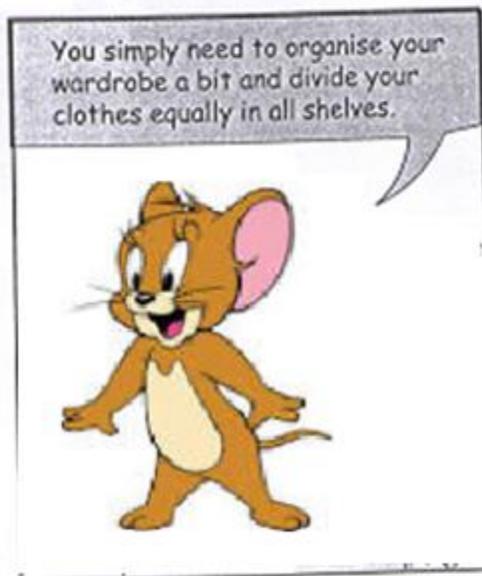
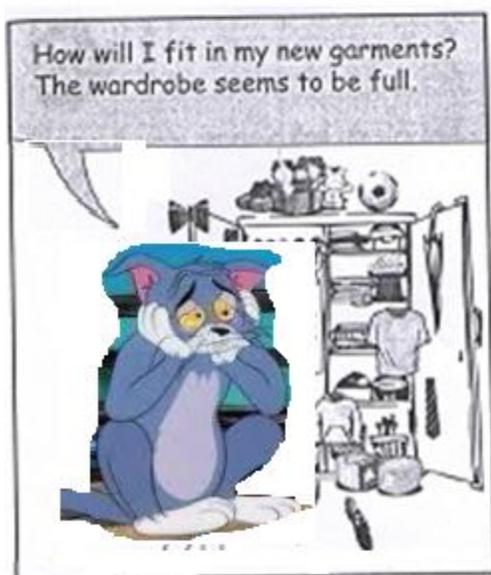
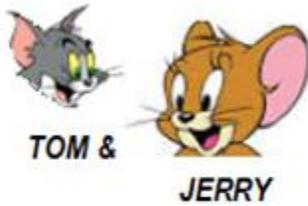
C- Approaching the expected standard

D- not meeting the expected standard

Roll No.	Name of the student	OCTOBER		NOVEMBER		DECEMBER	JANAUARY
		CH9	CH10	CH11, CH15		CH12	CH13,CH14
		LO 5	LO 16	LO 17	LO 18	LO8	LO6

CHAPTER - 1 (INTEGERS)

L.O. (I)



MONTH : **APRIL**
CHAPTER -1 : **INTEGERS**
L.O (I) : **multiplies / divides two integers**

1. Evaluate

i) $15 + (-8)$

ii) $-41 - 31$

iii) $41 - 17$

iv) $21 - 7 - 13 + 18$

v) $(-48) - (-36) + (-18)$

2. Subtract the sum of -1032 and 878 from -34.

3. Find the product

(i) $2 \times (-15) \times (-16)$

(ii) $(-3) \times (-3) \times (-3) \times (-3) \times (-3)$

(iii) $-41 \times 17 \times 31 \times 0$

4. What will be the sign of product if we multiply 90 negative integers and 9 positive integers?

5. Evaluate : (i) $98 \div (-14)$

(ii) $(-90) \div (-15)$

6. Fill ups :

(i) $(37) \div \underline{\hspace{2cm}} = 1$

(iii) $\underline{\hspace{2cm}} \div 169 = 0$

(ii) $32 \div \underline{\hspace{2cm}} = -1$

(iv) $\underline{\hspace{2cm}} \div (-1) = 36$

7. In a magic square each, row, column & diagonal have the same sum, find the value of A & B.

1	-10	0
A	-3	-2
-6	4	B

CHAPTER -2 (FRACTION AND DECIMALS)

L.O. (2)



<p>You seem to be happy today Barmy. That's nice.</p> 	<p>I have learnt to apply arithmetic in real life.</p> 
<p>That's wonderful. Can you tell me how will you do that?</p> 	<p>We must add our friends, subtract our enemies, multiply our joys and divide our sorrows.</p> 

MONTH : **APRIL**
CHAPTER -2 : **FRACTIONS AND DECIMALS**
L.O (2) : **Interprets the division and multiplication of fractions.**

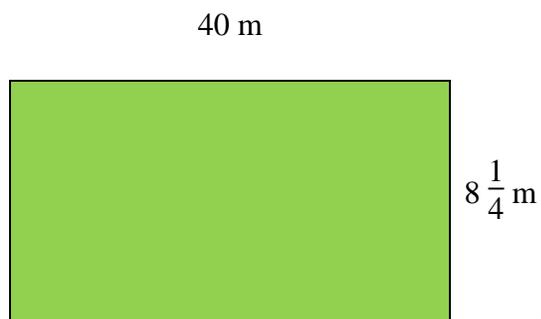
1. Simplify : (i) $\frac{2}{3} + \frac{5}{6} - \frac{1}{9}$
(ii) $8 - 4\frac{1}{2} - 2\frac{1}{4}$

2. Find the reciprocal of (i) $-\frac{7}{8}$ (ii) $1\frac{1}{4}$

3. Multiply (i) $\frac{14}{25} \times \frac{35}{51} \times \frac{34}{49}$
(ii) $7\frac{5}{9} \times 2\frac{2}{3}$

4. Evaluate : (i) $\frac{5}{9} \div \frac{2}{3}$ (ii) $28 \div 1\frac{3}{4}$ (iii) $(1-\frac{1}{2})(1-\frac{1}{3})(1-\frac{1}{4})$

5. Find area of rectangular park which is 40 m long and $8\frac{1}{4}$ m broad.



6. The product of two numbers is $15\frac{5}{6}$. If one of the number is $6\frac{2}{3}$, find the other number.

7. Heena solves the problem as shown below. At which step is she wrong?

	$\frac{5}{2} + \frac{3}{2}$
Step 1	$\frac{15}{6} + \frac{9}{6}$
Step 2	$\frac{24}{6}$
Step 3	$1\frac{2}{6}$
Step 4	4



MONTH : **APRIL**

CHAPTER -2 : **FRACTIONS AND DECIMALS**

L.O (3) : **for example interprets $\frac{2}{3} \times \frac{4}{5}$ as $\frac{2}{3}$ of .**

Also $\frac{1}{2} \div \frac{1}{4}$ interpreted as how many $\frac{1}{4}$ make $\frac{1}{2}$?

1. Find (i) $\frac{2}{5}$ of 40
(ii) $\frac{5}{9}$ of 48

2. Find (i) $\frac{2}{3}$ of an year. (ii) $\frac{4}{5}$ of an hour.

3. Which is greater? $\frac{5}{4}$ of $\frac{2}{3}$ or $\frac{7}{9}$ of $\frac{1}{4}$

4. Surbhi travels $2\frac{1}{3}$ Km daily to reach her school. She covers distance of $1\frac{5}{6}$ Km by walk and rest by bus. How much distance does she cover by bus?

5. The cost of $5\frac{1}{4}$ Kg of mangoes is Rs.189. At what rate per Kg are the mangoes being sold?

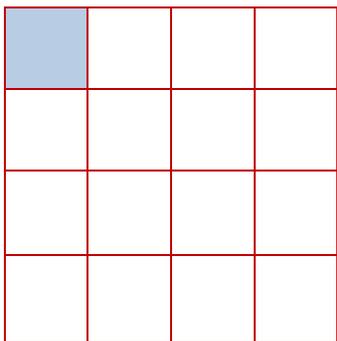
6. a) What fraction of faces are smiling?



- b) What fraction of faces are sad?



7. Choose correct option for shaded part :



a) $\frac{1}{2} \times \frac{1}{2} = \frac{1}{4}$

c) $\frac{1}{3} \times \frac{1}{3} = \frac{1}{9}$

b) $\frac{1}{4} \times \frac{1}{4} = \frac{1}{16}$

d) $\frac{1}{5} \times \frac{1}{5} = \frac{1}{25}$

MONTH : APRIL

CHAPTER -2 : FRACTIONS AND DECIMALS

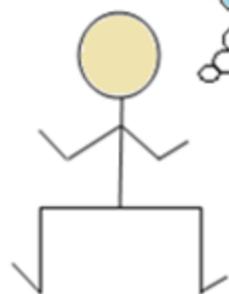
L.O (4) : uses algorithm to multiply and divide fractions/ decimals.

1. (i) Which is greater 2.03 or 2.30
(ii) Which is greater 0.43 or 0.4300
2. Express (i) 6 rupees 6 paise as decimal
(ii) 7380 g in Kg using decimal
3. Find the product (i) 73.9×10
(ii) 0.73×10
(iii) 0.08×100
(iv) $2.4 \times 1.5 \times 2.5$
(v) $0.2 \times 0.02 \times 0.002$
4. Divide (i) 2.34 by 100 (ii) 4.8 by 8
5. A bag of wheat weighs 97.8 Kg. How much wheat is contained in 100 bags?
6. A car covers a distance of 22.8 Km in 2.4 litres of petrol. How much distance will it cover in 1 litre of petrol?
7. Nobita ate $\frac{7}{8}$ th of chocolate.
How much part is left for you?



8.

Which contains
 $\frac{3}{4}$ litre of liquid ?



750 ml of water



500 ml of soup



125 ml of tea

MONTH : **MAY**
CHAPTER -3 : **DATA HANDLING**

L.O (19) : **Find various representative values for simple data from her/ his daily context like mean, median and mode.**

1. Find the mean of first five natural numbers.
2. Find the median of 3, 11, 7, 2, 5, 9, 9, 2, 10
3. Find the mode of the data
10, 8, 4, 7, 8, 11, 15, 8, 6, 8
4. The runs scored in a cricket match by 11 players is as follows :
6, 15, 120, 50, 100, 80, 10, 15, 8, 10, 15
Find the mean, mode and median of this data. Are they same?
5. The age (in years) of 15 students of class VII are :
13, 14, 14, 15, 16, 15, 14, 16, 12, 13, 14, 13, 14, 13, 14
 - a. What is the age of the youngest student?
 - b. Find the range of the ages of the students.
 - c. Find mean, mode and median of the data.

MONTH : **MAY**

CHAPTER -3 : **DATA HANDLING**

L.O (20) : **recognises variability in real life situation such as variations in the height of students in her class & uncertainly in happening of events like throwing a coin.**

1. A coin is tossed 100 times & head is obtained 59 times on tossing a coin at random. Find the probability of getting :

a) a head

b) a tail

2. A dice is tossed 80 times & the number 3 is obtained 14 times. Now a dice is tossed at random. Find the probability of getting the number 3.

3. In a survey of 100 ladies it was found that 36 like coffee while 64 dislike it. Out of these ladies, one is chosen at random. What is the probability that the chosen lady :

(i) likes coffee

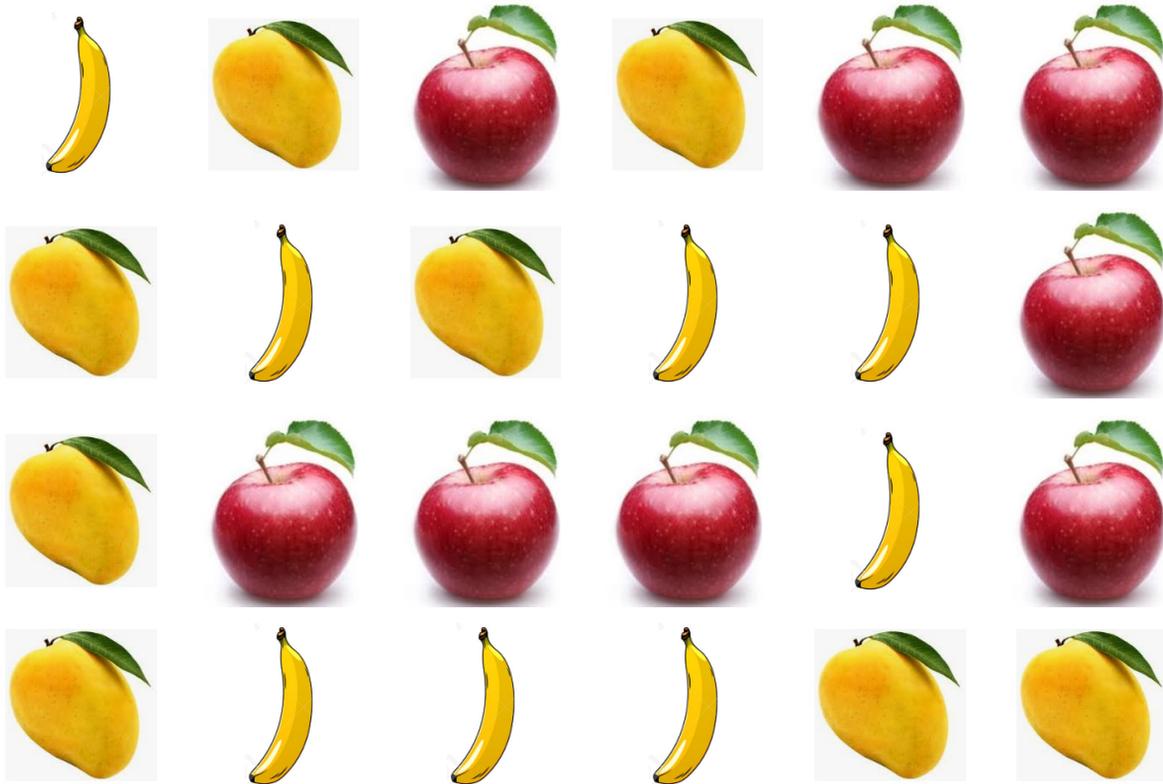
(ii) dislikes coffee.

4. A box contains 15 green balls & 10 Red balls. If a ball is taken out without seeing, then:

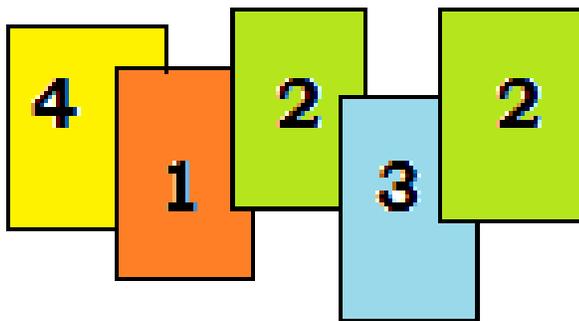
(i) What are the chances of getting a green ball?

(ii) What are the chances of getting a red ball?

5. a) Which fruit is least likely?
 b) What is probability of choosing mangoes?



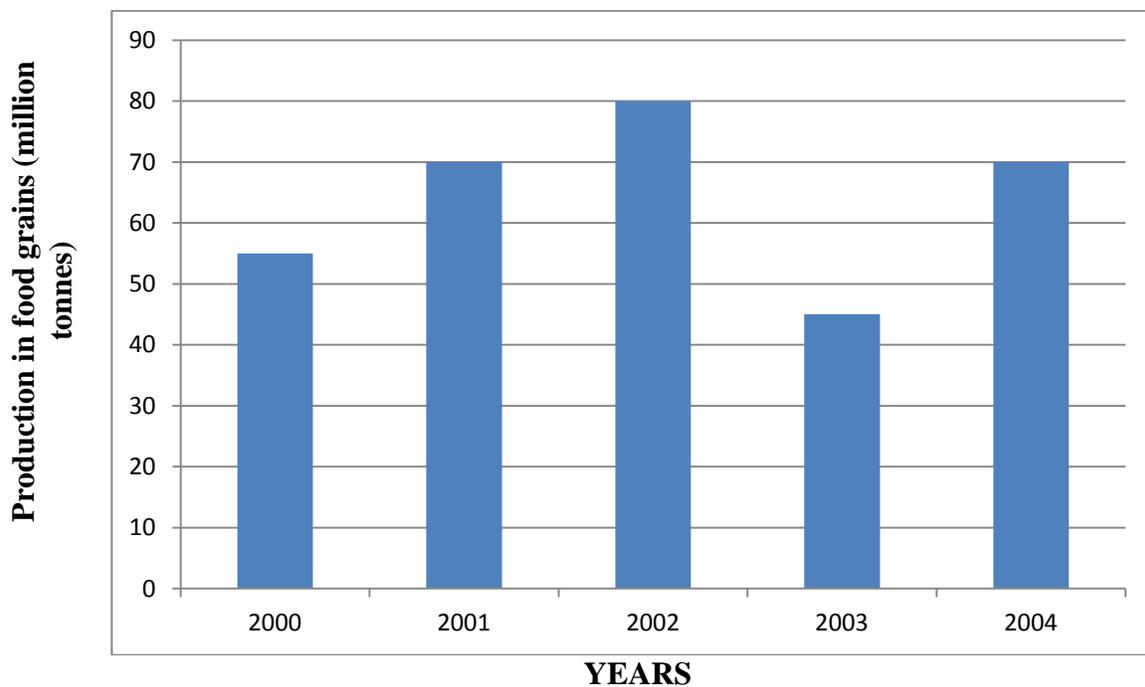
6. What is the probability of choosing number 2?



MONTH : **MAY**
CHAPTER -3 : **DATA HANDLING**

L.O (21) : **Interprets data using bar graph such as consumption of electricity is more in winter than summer, runs scored by a team in first 10 overs etc.**

1. Read the bar graph given below & answer the following questions :



- What information is given by the bar graph?
- What is represented on x axis & y axis ?
- In which year was the production maximum ?
- After which year was there a sudden fall in the production?
- Find the ratio between the maximum production & the minimum production during the given period.

2. Given below is a table which shows the year wise strength of a school. Represent this data by a bar graph.

Year	2005-2006	2006-2007	2007-2008	2008-2009	2009-2010
No. of students	800	975	1100	1400	1625

3. Draw the double bar graph for the runs scored by the two teams in first six overs.

Overs →	1	2	3	4	5	6
Team A	15	8	6	12	20	8
Team B	10	10	14	14	6	4

- 1) What is mean run scored by Team A ?
- 2) Find the mode of runs scored by Team B.

MONTH : MAY

CHAPTER -4 : SIMPLE EQUATIONS

L.O (7) : Represents daily life situations in the form of a simple equation and solve it.

1. Solve the equations :

a) $y + 6 = 10$ b) $3m = 48$ c) $\frac{x}{4} = -4$

d) $x - 5 = -7$

2. Solve the following equations :

a) $3x - 5 = 7$ b) $4(m + 3) = 18$

c) $4 + 6(y - 1) = 46$

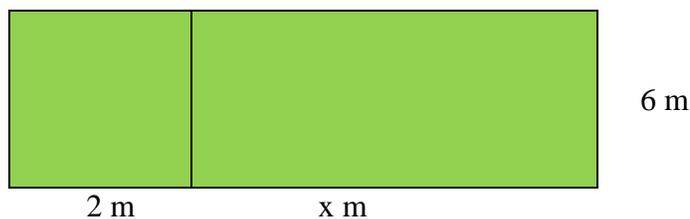
3. Form the equations & solve it.

a) Ten times x is 80.

b) $\frac{1}{3}$ rd of a number plus 7 is 14

4. Kareena's father age is 3 years more than 4 times Kareena's age. Find Kareena's age, if her father's age is 51 years.

5. Write the expression for area of rectangular garden of Salil (see figure).



MONTH : JULY

CHAPTER -5 : LINES AND ANGLES

L.O (12) : Classifies pairs of angles based on their properties` as linear, supplementary, complementary, adjacent and vertically opposite angles and find value of one when the other is given.

1. Identify complementary and supplementary pair of angles :

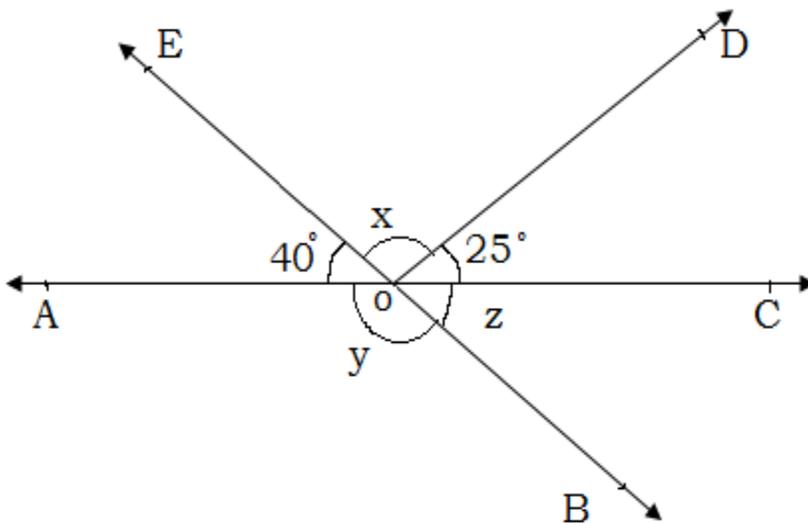
(i) 60° , 120°

(ii) 45° , 45°

(iii) 130° , 50°

(iv) 75° , 15°

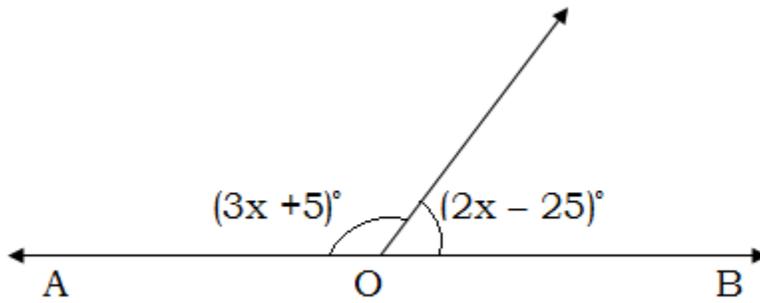
2. Find the value of x, y, z in the given figure .



3. (i) Find the angle which is equal to its own complement ?
(ii) Find the angle which is equal to its own supplement ?



4. In the given figure, what value of x will make AOB a straight line.



5. Among two supplementary angles, the measure of the larger angle is 36° more than the measure of the smaller. Find their measures.

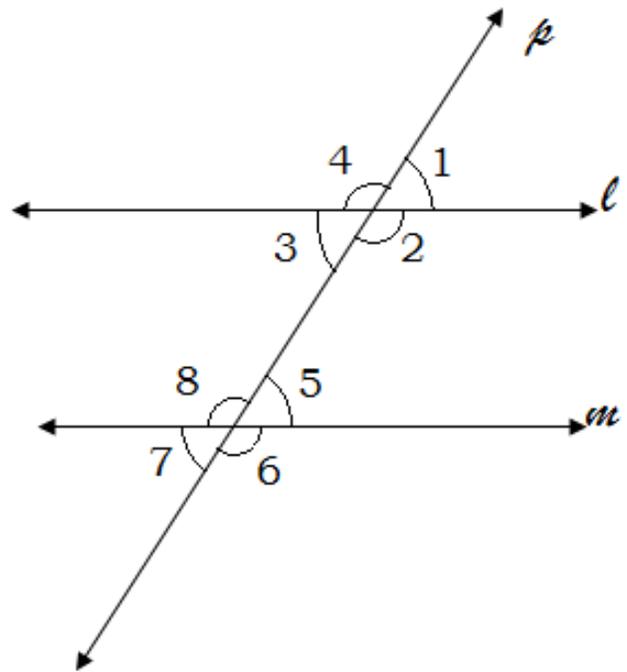
MONTH : **JULY**

CHAPTER -5 : **LINES AND ANGLES**

L.O (13) : **verifies the properties of various pairs of angles formed when a transversal cuts two lines.**

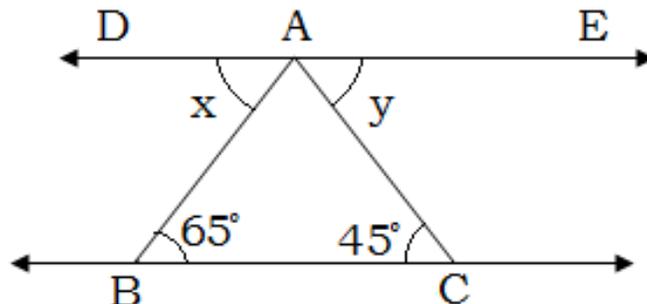
1. In the given figure, identify

- (i) The pairs of corresponding angles.
- (ii) The pairs of alternate interior angles.
- (iii) The pairs of interior angles on the same side of the transversal
- (iv) The vertically opposite angles.
- (v) The pairs of alternate exterior angles.



2. In the given figure, $DE \parallel BC$.

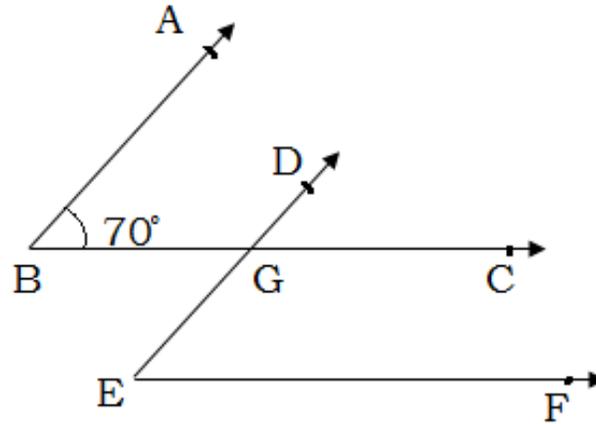
Find the values of x and y .



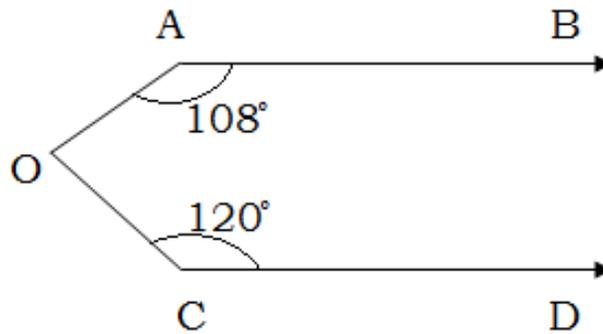
3. In the given figure, the arms of two angles are parallel. If $\angle ABC = 70^\circ$, then find

(i) $\angle DGC$

(ii) $\angle DEF$



4. In the given figure, $AB \parallel CD$, find $\angle AOC$.



MONTH : JULY

CHAPTER -6 : (TRIANGLE AND ITS PROPERTIES)

L.O (14) : Finds unknown angle of a triangle when its two angles are known.

1. Find the value of x in the given figures :

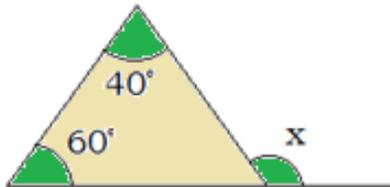


Fig. 1

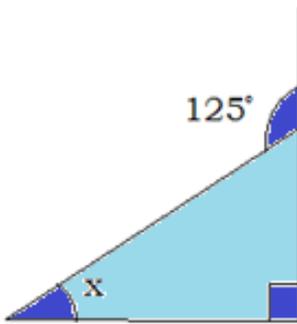


Fig. 2

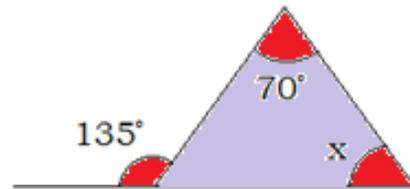


Fig. 3

2. Find the value of x in the given figures :

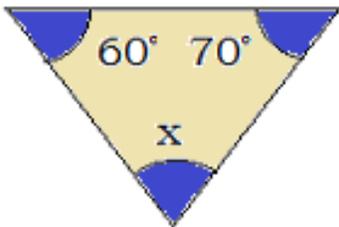


Fig. 1



Fig. 2

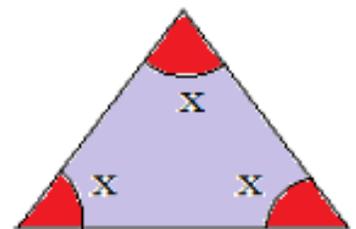


Fig. 3

3. Find the values of x and y in the given figures :

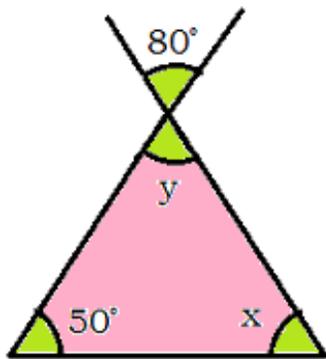


Fig. 1

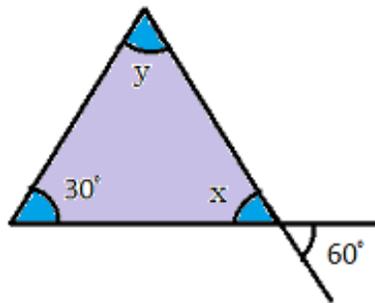


Fig. 2

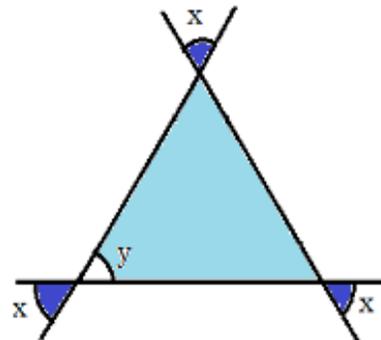


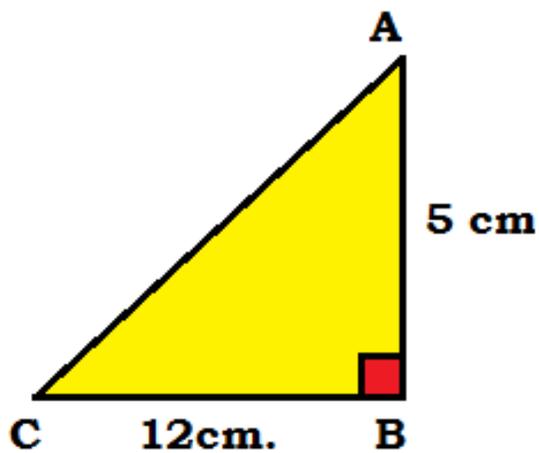
Fig. 3

4. Is it possible to have a triangle with the following sides ?

(i) 2cm, 3cm, 5 cm.

(ii) 3cm, 6cm, 7cm

5. In the given figure $\angle B = 90^\circ$. Find AC



6. A line is broken at a height of 5m from the ground & its top touches the ground at a distance of 12m from the base of tree. Find the original height of the tree.

MONTH : JULY

CHAPTER -7 : CONGRUENCE OF TRIANGLES

L.O (15) : Explains congruency of triangles on the basis of the information given about them like (SSS, SAS, ASA, RHS).

1. Given below are pairs of congruent triangles. State the property of congruence and name the congruent triangles in each case.

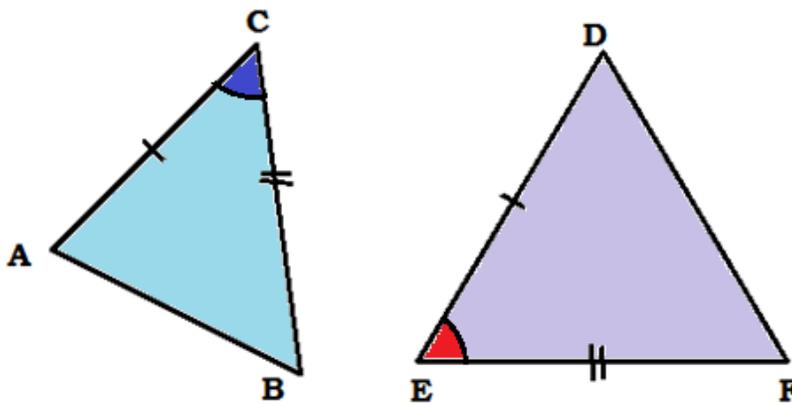


Fig 1

$\triangle ABC \cong$ _____

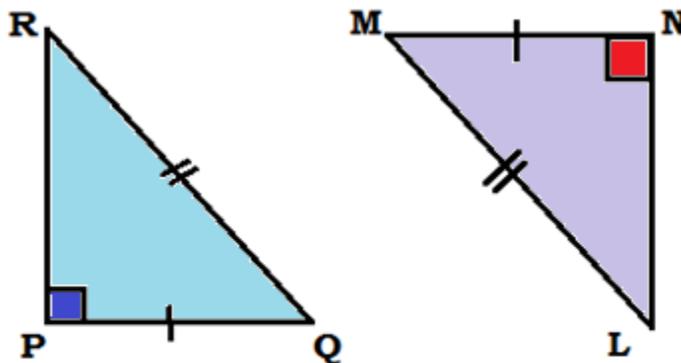


Fig 2

$\triangle RPQ \cong$ _____

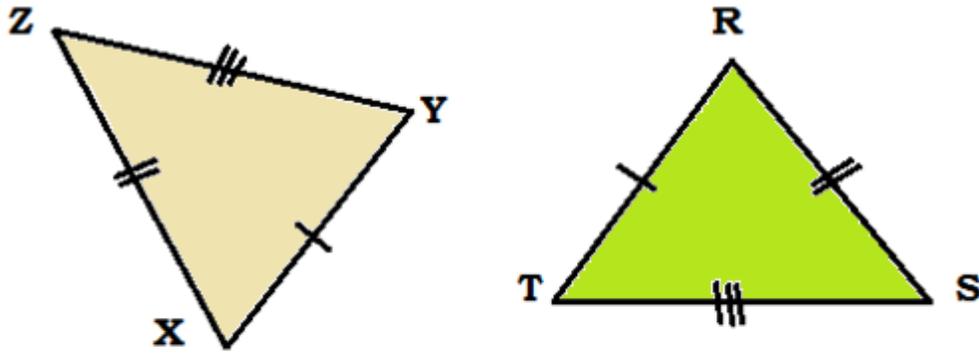


Fig 3

$\Delta XYZ \cong$ _____

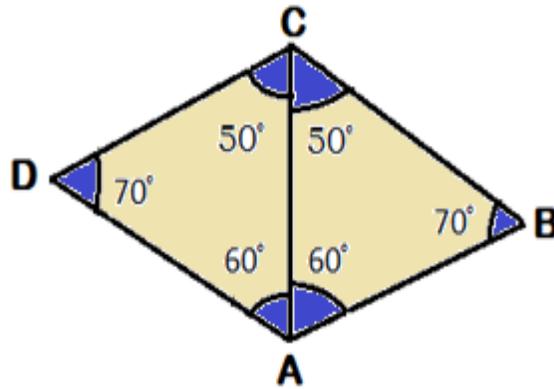


Fig 4

$\Delta ADC \cong$ _____

2. In ΔABC , $\angle A = 30^\circ$, $\angle B = 40^\circ$ and $\angle C = 110^\circ$.

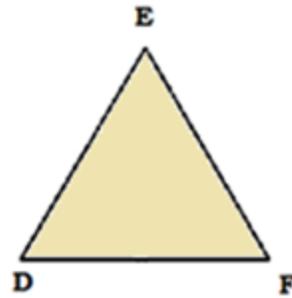
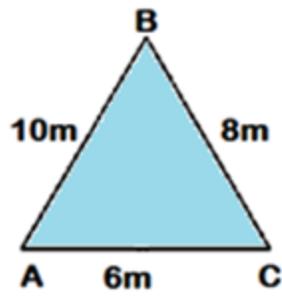
In ΔPQR , $\angle P = 30^\circ$, $\angle Q = 40^\circ$ and $\angle R = 110^\circ$.

A student says that $\Delta ABC \cong \Delta PQR$ by AAA congruence criterion. Is he justified ?

Why or why not?



3.



My park is $\triangle ABC$

My park is $\triangle DEF$. It is congruent to your park. Tell the sides of my park.

CHAPTER 8

COMPARING QUANTITIES



Money, money, money. It makes the world sweet like honey. You have penny.

A grey cartoon cat with a white belly and paws is shown in a dynamic, dancing pose. He has his arms outstretched and a wide, joyful expression on his face.

What's wrong?

A brown cartoon mouse with a white belly is standing upright with his hands on his hips. He has a questioning and slightly confused expression on his face.

Geeee...I have got my pocket money today.

The grey cartoon cat is shown in the same dancing pose as in the first panel, appearing very happy and content.

Hah! No wonder you are delighted.

The brown cartoon mouse is standing with his hands on his hips, looking happy and satisfied with a wide smile.

MONTH : AUGUST

CHAPTER -8 : COMPARING QUANTITIES

L.O (10) : Problem related to conversion of percentage to fraction and decimal and vice versa.

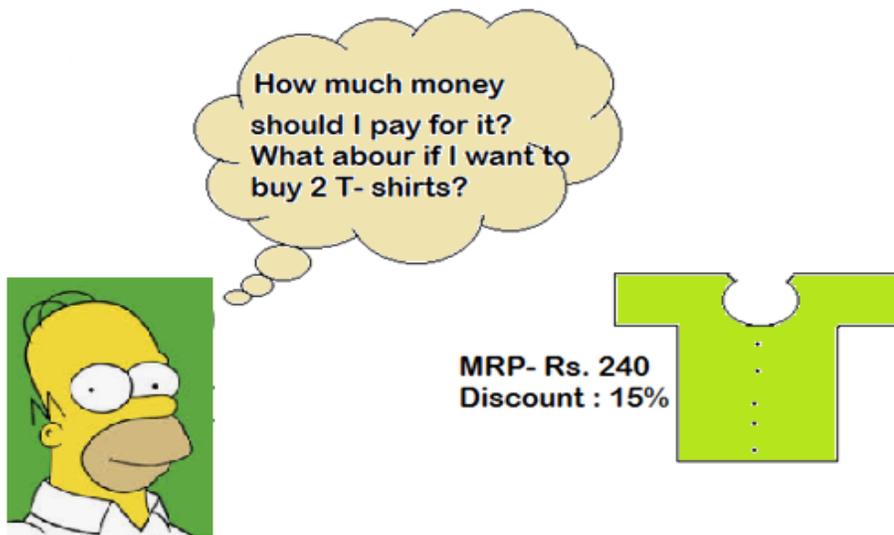
1. We have a basket full of apples, oranges & mangoes. If 50% are apples, 30% are oranges, then what percentage are mangoes?
2. Convert given decimal fractions to percents .
a) 0.65 b) 0.02 c) 2.5
3. Convert given fractional numbers to percent.
a) $\frac{1}{8}$ b) $\frac{5}{4}$
4. Convert given percents to decimal fractions & also to fractions in simplest form.
a) 25 % b) 150%
5. Find a) 12% of 240 b) 15% of 300
6. Sajid got 75 marks out of 100 & Meena got 20 marks out of 50. Find percentage of their marks and who got more marks & by how much?

MONTH : AUGUST

CHAPTER -8 : COMPARING QUANTITIES

L.O (11) : Calculates profit/ loss percentage and rate percentage in simple Interest.

1. Rs. 10,000 is invested at 5% interest rate p.a. Find the interest at the end of one year.
2. Anita bought a T.V. for Rs. 5,000. If she sells it at the loss of 15%, find the price at which she sold it.
3. An article was sold for Rs. 250 with a profit of 5%. What was its cost price?
4. The numbers of students in class VII increases from 40 to 45. Find the percentage increase in the strength of class VII.
5. A football is bought for Rs.120 & sold for Rs.105. Find the gain % or loss %.
6. Find the SP when CP = Rs.950, gain= 6%.
- 7.



MONTH : OCTOBER

CHAPTER -9 : RATIONAL NUMBER

L.O (5) : Solves problems related to daily life situation involving rational numbers.

1. Find four rational numbers equivalent to (i) $\frac{8}{3}$ (ii) $\frac{3}{4}$ —

2. Express (i) $\frac{22}{55}$ (ii) $\frac{-36}{-45}$ in standard form.

3. Simplify :

(i) $\frac{5}{9} + \frac{2}{3} + 4$

(ii) $\frac{-13}{8} + \frac{5}{16} + (\frac{-1}{4})$

(iii) $\frac{3}{10} \times (-9)$

(iv) $\frac{3}{-5} \times \frac{-5}{3}$

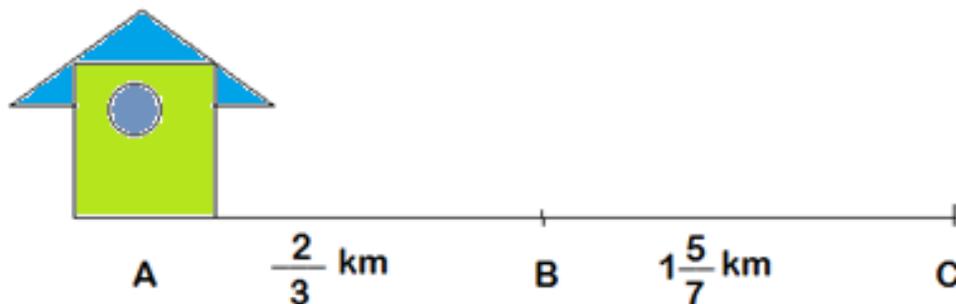
(v) $\frac{-3}{5} \div 2$

(vi) $\frac{-7}{12} \div (\frac{-2}{13})$

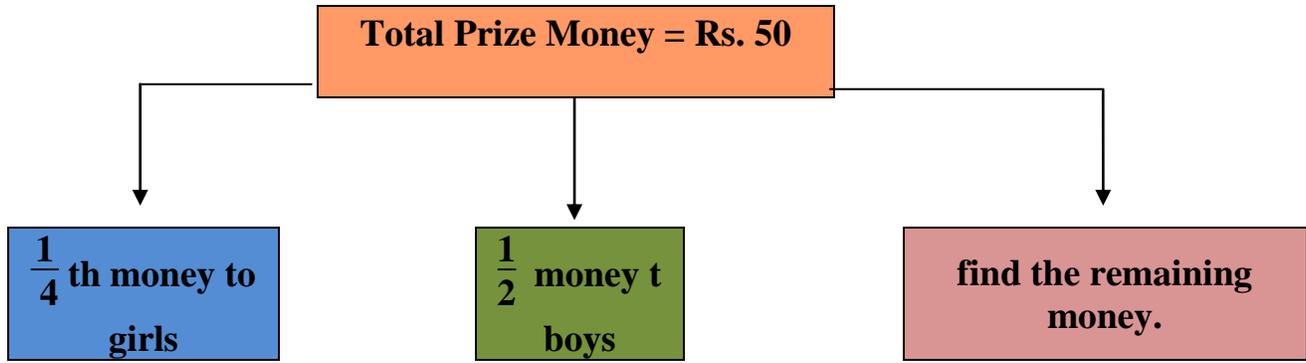
4. The cost of 15 pencils is Rs.75. Find the cost of each pencil.

5. Seema walks $\frac{2}{3}$ Km from her home, then again she walked $1\frac{5}{7}$ Km further in the same direction.

Find the total distance she walked from her home.



6.



MONTH : OCTOBER

CHAPTER -10 : PRACTICAL GEOMETRY

L.O (16) : using ruler and a pair of compasses constructs , a line parallel to a given line from a point outside it and triangle.

1. a) The supplementary angle 45° is _____
b) The complementary angle of 80° is _____.
2. Construct a ΔPQR in which $PQ = 3\text{cm}$, $QR = 4\text{cm}$, $PR = 5\text{cm}$. Identify the type of triangle.
3. Construct a triangle ΔABC in which $AB = 3.8\text{ cm}$, $\angle A = 60^\circ$ and $AC = 5\text{cm}$.
4. Construct ΔABC where $m\angle A = 60^\circ$, $m\angle B = 30^\circ$ and $AB = 4\text{cm}$.
5. Construct a right angled triangle whose hypotenuse is 6cm and one of the legs is 4cm long.

MONTH : NOVEMBER

CHAPTER -11 : PERIMETER & AREA

L.O (17) : Find out approximate area of closed shapes by using unit square grid / graph sheet.

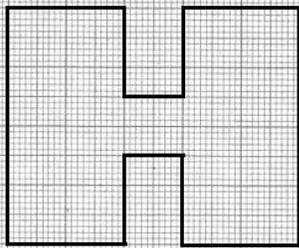


fig (1)

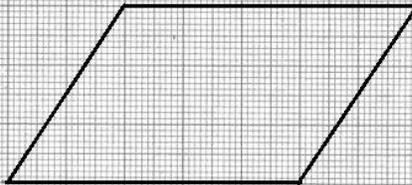


fig (2)

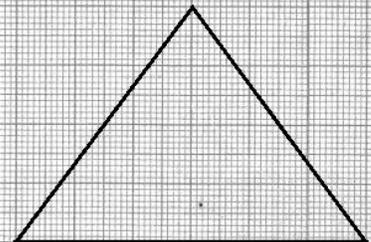


fig (3)

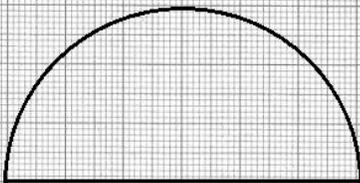


fig (4)

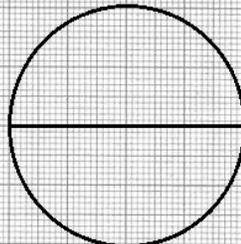


fig (5)

(1) Area of Fig 1 is _____ squares.

(2) Area of Fig 2 is _____ squares.

(3) Area of Fig 3 is _____ squares.

(4) Area of Fig 4 is _____ squares.

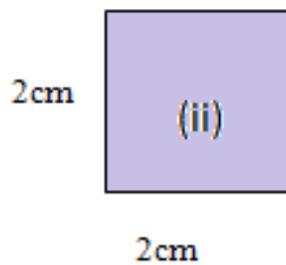
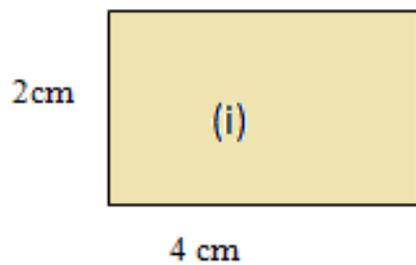
(5) Area of Fig 5 is _____ squares.

MONTH : NOVEMBER

CHAPTER -11 : PERIMETER & AREA

L.O (18) : Calculate areas of the regions enclosed in a rectangle & a square .

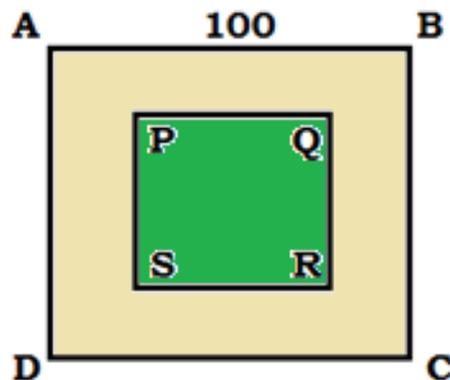
1. Find the area of the given figures (i) (ii)



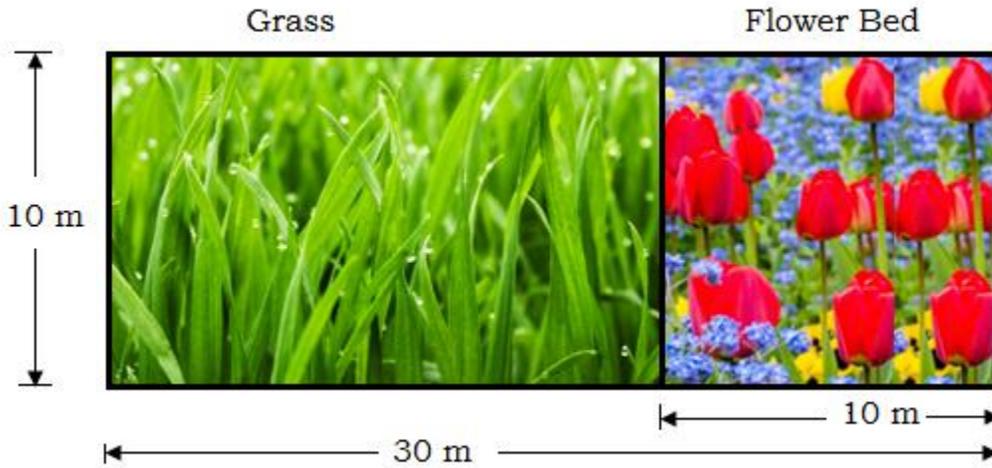
2. Find the area of square park whose perimeter is 320 m.

3. A wire is in the shape of a square of side 10cm. If wire is rebent into a rectangle of length 12cm. Find its breadth. Which enclosed more area, the square or the rectangle?

4. A path 5m wide runs along inside square park of side 100m. find the area of path. Also find the cost of cementing it at the rate of Rs. 250 per 10 m².



5.



Answer the following :

- a) Shape of the grass garden is _____
- b) Perimeter of grass garden is _____
- c) Shape of flower bed is _____
- d) Perimeter of flower bed is _____
- e) Ratio of perimeter of flower bed to perimeter of grass garden

- f) Which has larger area? (Grass garden/ Flower bed) _____

MONTH : DECEMBER

CHAPTER -12 : ALGEBRAIC EXPRESSION

L.O (8) : adds / subtract algebraic expression .

1. Simplify combining like terms.

a) $12m^2 - 9m + 5m - 4m^2 - 7m + 10 + 7$

b) $5x^2y - 5x^2 + 3yx^2 - 3y^2 + 8x^2y + 8x^2$

2. Add (i) $4x^2y$, $-3xy^2$, $-5xy^2$, $5x^2y$

(ii) t , $8tz$, $3tz - z$, $z - t$

3. Subtract i) $5a^2 - 7ab + 5b^2$ from $3ab - 2a^2 - 2b^2$

ii) $6xy$ from $-12xy$

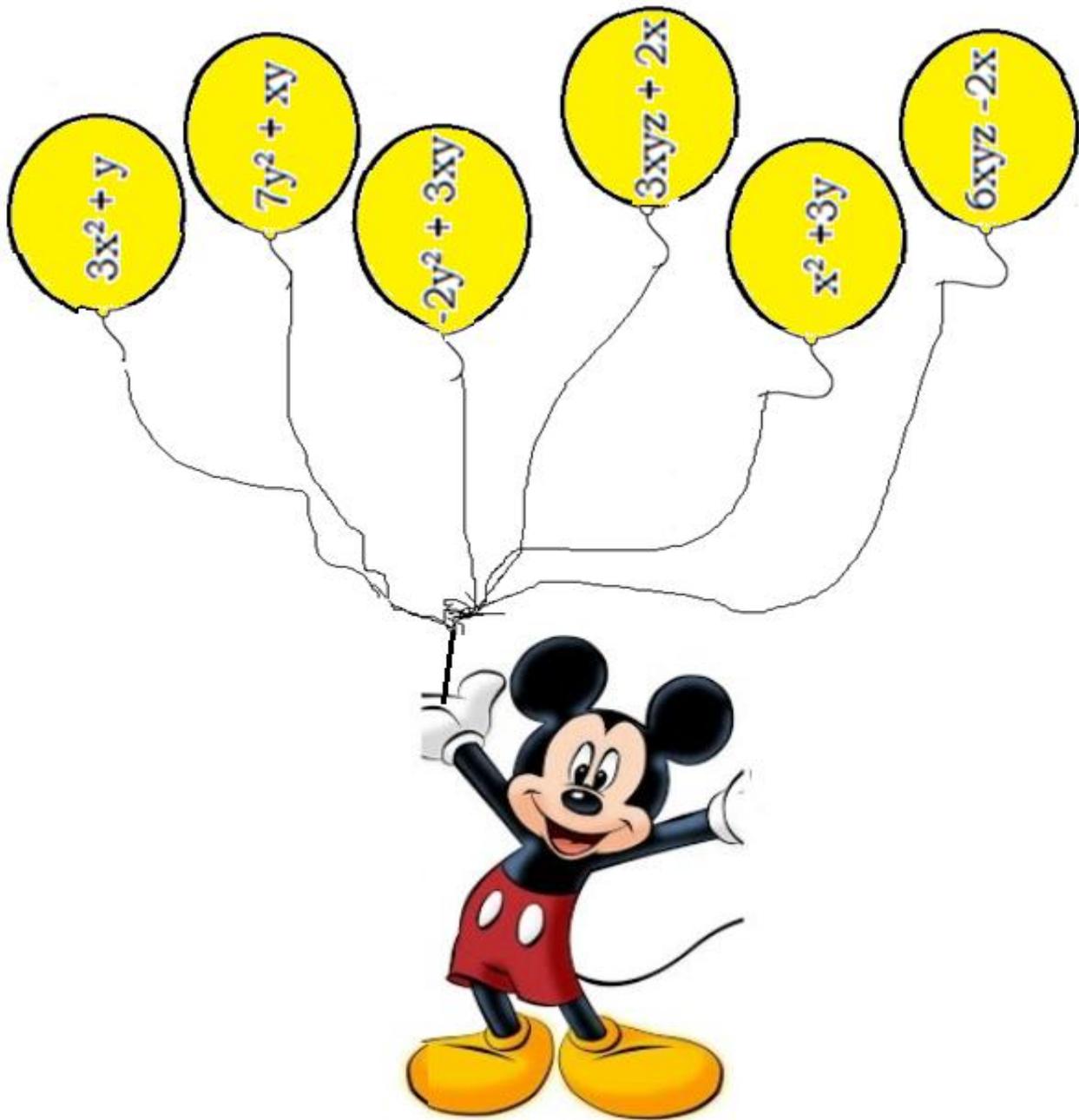
4. Add $\frac{3x}{5}$, $\frac{2x}{3}$, $\frac{-4x}{5}$

5. Simplify :

i) $(5x - 9y) - (-7x + y)$

ii) $(7 - 2x + 5y) - (x - y) + (5x + 3y - 7)$

6. Help the balloon seller to colour the balloons of like terms with same colour. Find their sum also.



MONTH : **JANUARY**
CHAPTER -13 : **EXPONENTS & POWERS**

L.O (6) : **uses exponential form of numbers to simplify problems involving multiplication and division of large numbers.**

1. Express following number as product of power of prime numbers:

i) 72 ii) 432 iii) 256 iv) 1000

2. Fill ups

$$a^m \times a^n = \underline{\hspace{2cm}}$$

$$a^m \div a^n = \underline{\hspace{2cm}}$$

$$a^m \cdot a^n = \underline{\hspace{2cm}}$$

$$a^0 = \underline{\hspace{2cm}}$$

3. (i) $(-1)^{12} = \underline{\hspace{2cm}}$ (iii) $(24)^0 = \underline{\hspace{2cm}}$

(ii) $(-1)^{23} = \underline{\hspace{2cm}}$ (iv) $(0)^{12} = \underline{\hspace{2cm}}$

4. Simplify : (i) $(2^{16} \div 2^{12}) \times 2^3$ (ii) $6^{20} \div 6^{18}$

(iii) $\frac{3 \times 7^2 \times 11^8}{21 \times 11^3}$ (iv) $\frac{(2^5)^2 \times 7^3 \times t^8}{8^3 \times 7 \times t^4}$

5. How to get '1' by writing '7' three times?
