

PRACTICE QUESTION PAPER - I
CLASS-IX
MATHEMATICS

Time: 3 Hrs.

M.M. 80

General Instruction:

- All questions are compulsory.
- The paper consists of 40 questions divided into four sections A, B, C and D. Section A comprises of 20 questions of 1 marks each. Section B comprises of 6 question of 2 marks each. Section C comprises of 8 questions of 3 marks each. Section D comprises of 6 question of 4 marks each.
- There is no over all choice in this question paper. All though internal choices has been provided in some question.

SECTION - A

1. $\sqrt[4]{\sqrt[3]{2^2}}$
- | | |
|-----------------------|-------------|
| a) $2^{-\frac{1}{6}}$ | b) 2^{-6} |
| c) $2^{\frac{1}{6}}$ | d) 2^6 |

or

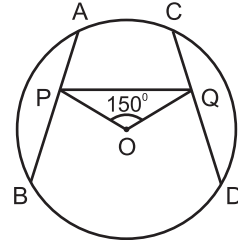
$$(625)^{0.16} \times (625)^{0.09} = ?$$

- | | |
|--------|-----------|
| a) 5 | b) 25 |
| c) 125 | d) 625.25 |
2. If $\frac{x}{y} + \frac{y}{x} = -1$ ($x, y \neq 0$). the value of $x^3 - y^3$ is
- | | |
|-------|------------------|
| a) -1 | b) 1 |
| c) 0 | d) $\frac{1}{2}$ |
3. If $a + b + c = 0$ then $\frac{a^2}{bc} + \frac{b^2}{ca} + \frac{c^2}{ab} = ?$
- | | |
|-------|------|
| a) 1 | b) 0 |
| c) -1 | d) 3 |

4. The values of $249^2 - 248^2$ is
- | | |
|----------|--------|
| a) 1^2 | b) 477 |
| c) 487 | d) 497 |
5. If $(2, 0)$ is a solution of the linear equation $2x + 3y = K$, then the value of K is
- | | |
|------|------|
| a) 4 | b) 6 |
| c) 5 | d) 2 |
6. How many linear equations in x and y can be satisfied by $x = 1$ and $y = 2$?
- | | |
|--------------------|----------|
| a) Only One | b) Two |
| c) Infinitely many | d) Three |
7. The point whose ordinate is 4 and which lies on y -axis is
- | | |
|-------------|-------------|
| a) $(4, 0)$ | b) $(0, 4)$ |
| c) $(1, 4)$ | d) $(4, 2)$ |
- or
- If $P(-1, 1)$, $Q(3, -4)$, $R(1, -1)$, $S(-2, -3)$ and $T(-4, 4)$ are plotted on the graph paper, then the points in the fourth quadrant are
- | | |
|------------|------------|
| a) P and T | b) Q and R |
| c) Only S | d) P and R |
8. The angles of a triangle are in the ratio $2 : 4 : 3$. The smallest angle of the triangle is
- | | |
|---------------|---------------|
| a) 60° | b) 40° |
| c) 80° | d) 20° |
9. Two sides of a triangle are of length 5cm and 1.5cm. The length of the third side of the triangle cannot be.
- | | |
|----------|----------|
| a) 3.4cm | b) 3.6cm |
| c) 3.8cm | d) 4.1cm |

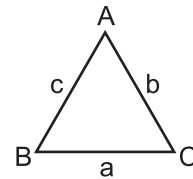
10. The figure obtained by joining the mid point of the sides of a rhombus, taken in order is
- | | |
|--------------|----------------------|
| a) a rhombus | b) a rectangle |
| c) a square | d) any Parallelogram |

11. In Fig. AB and CD are two equal chords of a circle with centre O. OP and OQ are perpendiculars on chords AB and CD respectively. If $\angle POQ = 150^\circ$, then $\angle APQ$ is equal to



- | | |
|---------------|---------------|
| a) 30° | b) 75° |
| c) 15° | d) 60° |

12. By the Heron's formula, the area of ΔABC is given by $\Delta = \underline{\hspace{2cm}}$ sq. unit.



13. The sides of a triangle are 56cm, 60cm, and 52cm long. Then the area of the triangle is

- | | |
|----------------------|----------------------|
| a) 1322cm^2 | b) 1311cm^2 |
| c) 1344cm^2 | d) 1392cm^2 |

14. The sides of a triangle are in the ratio 5:12:13 and its perimeter is 150cm. The area of the triangle is

- | | |
|---------------------|---------------------|
| a) 375cm^2 | b) 750cm^2 |
| c) 250cm^2 | d) 500cm^2 |

15. The total surface area of a cone whose radius is $\frac{r}{2}$ and short height $2l$ is

- | | |
|---------------------|------------------------------|
| a) $2\pi r (l + r)$ | b) $\pi r (l + \frac{r}{4})$ |
| c) $\pi r (l + r)$ | d) $2\pi r l$ |

16. The radius of a hemispherical balloon increases from 6cm to 12cm as air is being pumped into it. the ratios of the surface areas of the

balloon in the two cases is

- a) 1 : 4
- b) 1 : 3
- c) 2 : 3
- d) 2 : 1

17. The class mark of the class 90 – 120 is :

- a) 90
- b) 105
- c) 115
- d) 120

18. The mean of five number is 30. If one number is excluded their mean becomes 28. The excluded number is :

- a) 28
- b) 30
- c) 35
- d) 38

19. A coin is tossed 60 times and the tail appears 35 times. What is the probability of getting a head ?

- a) $\frac{7}{12}$
- b) $\frac{12}{7}$
- c) $\frac{5}{12}$
- d) $\frac{12}{5}$

20. Fill in the blanks :

If E be an event, then $P(E) + P(\text{not } E) = \underline{\hspace{2cm}}$

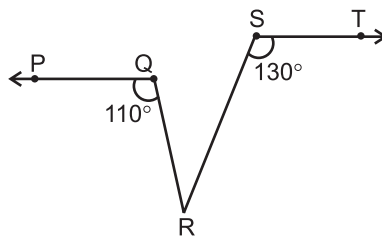
SECTION - B

21. If the point (3, 4) lies on the graph of $3y = ax + 7$, then find the value of a .

or

Find four different solutions of $2x + y = 6$.

22. If $PQ \parallel ST$, $\angle PQR = 110^\circ$ and $\angle RST = 130^\circ$, find $\angle QRS$



23. Find the area of the trapezium whose parallel sides are 14cm and 10cm and whose height is 6cm.
24. The perimeter of a an isosceles triangle is 32cm. The ratio of the equal side to its base is 3:2. Find the area of the triangle.
25. The diameter of a roller is 84cm and its length is 120cm. It takes 500 complete revolutions to move once cover to level a playground. Find the area of the playground is m^2 .
26. A die was rolled 100 times and the number of times 6 appeared was noted. If the probability of getting a 6 be $\frac{2}{5}$, how many times did 6 come up ?

or

1500 families with 2 children each, were selected randomly and the following data were recorded.

Number of girls in a family	2	1	0
Number of families	102	675	723

out of these families, one family is selected at random. What is the probability that the selected family has.

- i) 2 girls
- ii) 1 girl

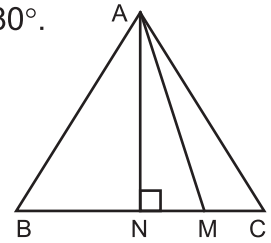
SECTION - C

27. If $a = 2 + \sqrt{3}$, then find the value of $a - \frac{1}{a}$.
28. Factorise : $a(a-1) - b(b-1)$
or
If $P = 2 - a$, prove that $a^2 + 6ap + p^3 - 8 = 0$
29. The taxi fare in a city as follows : for the first kilometre, the fare is ₹ 25 and for the subsequent distance it is ₹ 14 per km. Taking the distance covered as x km and total fare as ₹ y , write the linear equation for this information and draw its graph.
30. Three vertices of a rectangle are $(3, 2)$, $(-4, 2)$ and $(-4, 5)$, plot these points on a graph paper and the coordinates of the fourth vertex.

31. Prove that the sum of three angles of a triangle is 180° .

or

In a $\triangle ABC$, $\angle B > \angle C$ if AM is the bisector of $\angle ABC$ and $AN \perp BC$. Prove that $\angle MAN = \frac{1}{2}(\angle B - \angle C)$



32. The measure of angles of a quadrilateral are $(x+20)^\circ$, $(x-20)^\circ$, $(2x+5)^\circ$ & $(2x-5)^\circ$. Find the value of x .

or

E is the mid point of the median AD of $\triangle ABC$ and BE is produced to meet AC at F. Show that $AF = \frac{1}{3} AC$.

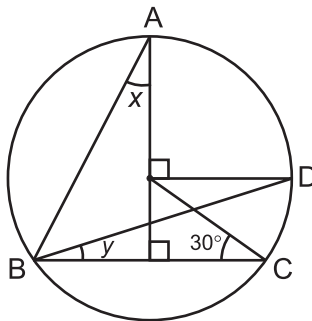
33. Prove that parallelogram on the same base and between the same parallels are equal in area.

or

ABCD is trapezium in which $AB \parallel DC$, $DC = 30\text{cm}$ and $AB = 50\text{cm}$. If x and y are, respectively the mid points of AD and BC prove that

$$\text{ar}(\text{DCYX}) = \frac{7}{9} \text{ar}(\text{XYBA})$$

34. In figure, O is the centre of the circle. $\angle BCO = 30^\circ$. Find x and y .



SECTION – D

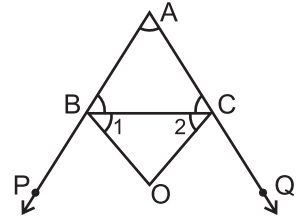
35. Show that :

$$\frac{1}{(3 - \sqrt{8})} - \frac{1}{(\sqrt{8} - \sqrt{7})} + \frac{1}{(\sqrt{7} - \sqrt{6})} - \frac{1}{(\sqrt{6} - \sqrt{5})} + \frac{1}{(\sqrt{7} - 6)} = 5$$

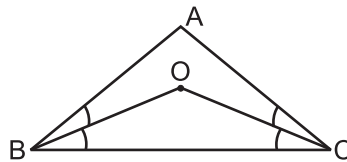
36. Factorise the expression
 $8x^3 + 27y^3 + 36x^2y + 54xy^2$

37. In a $\triangle ABC$.

- i) The sides AB and AC are produced to P and Q respectively. If the bisectors of $\angle PBC$ and $\angle QCB$ intersect at a point O. Prove that $\angle BOC = 90^\circ - \frac{1}{2}\angle A$



- ii) The bisectors of $\angle B$ and $\angle C$ intersect each other at a point O. Prove that $\angle BOC = 90^\circ + \frac{1}{2}\angle A$



or

If the bisector of an angle of a triangle also bisect the opposite side. Prove that the triangle is isosceles.

38. Construct a triangle XYZ in which $\angle Y = 30^\circ$, $\angle Z = 90^\circ$ and $XY + YZ + ZX = 11\text{cm}$. Write steps of construction also.
39. The radius of a sphere is increased by 10%. Prove that the volume will be increased by 33.1% approximately.

or

The ratio of the curved surface area and the total surface area of a circular cylinder is 1:2 and the total surface area is 616cm^2 . Find its volume

40. The mean marks (out of 100) of boys and girls in an examination are 70 and 73 respectively. If the mean marks of all the students in the examination is 71. Find the ratio of the number of boys to the number of girls.

or

The mean of 100 items was found to be 64. Later on it was discovered that two items misread as 26 and 9 instead of 36 and 90 respectively. Find the correct mean.

SOLUTION
PRACTICE QUESTION PAPER - I

1. c) $2^{\frac{1}{6}}$ or a) 5
 2. c) 0
 3. d) 3
 4. d) 497
 5. a) 4
 6. c) Infinitely many
 7. b) (0, 4) or b) Q and R
 8. b) 40°
 9. a) 3.4cm
 10. b) a rectangle
 11. b) 75°
 12. $\Delta = \sqrt{s(s-a)(s-b)(s-c)}$
 13. c) $13\ 4\ 4\text{cm}^2$
 14. b) 750cm^2
 15. b) $\pi r (l + \frac{r}{4})$
 16. a) 1 : 4
 17. b0 105
 18. d) 38
 19. c) $\frac{5}{12}$
 20. $P(E) + P(\text{Not } E) = 1$ [$P(E) + P(\bar{E}) = 1$]
 21. $a = \frac{5}{3}$ or $y = 6 - 2x$ Four solutions are
 $(x = 1 \Rightarrow y = 4)$ $(x = 3 \Rightarrow y = 0)$
 $(x = 2 \Rightarrow y = 2)$ $(x = 4 \Rightarrow y = -2)$
- | | | | | |
|---|---|---|---|----|
| x | 1 | 2 | 3 | 4 |
| y | 4 | 2 | 0 | -2 |
- other solutions
may be possible
22. $\angle QRS = 60^\circ$
 23. 72cm^2

24. $32\sqrt{2} \text{ cm}^2$

25. 1584 m^2

26. 40 times or i) $\frac{102}{1500} = 0.068$ ii) $\frac{675}{1500} = 0.45$

27. $\boxed{a - \frac{1}{a} = 2\sqrt{3}}$ $\therefore a = 2 + \sqrt{3}$

$\therefore \frac{1}{a} = 2 - \sqrt{3}$

$a - \frac{1}{a} = (2+\sqrt{3}) - (2-\sqrt{3}) = 2+\sqrt{3} - 2+\sqrt{3} = 2\sqrt{3}$

28. $a(a-1) - b(b-1) = a^2 - a - b^2 + b = (a^2 - b^2) - (a-b) = (a-b)(a+b) - (a-b)$
 $= (a-b)(a+b-1)$

Hence $a(a-b) - b(b-1) = (a-b)(a+b-1)$

or

$P = 2-a \Rightarrow a+p+(-2) = 0$

$\Rightarrow a^3 + p^3 + (-2)^3 = 3 \times a \times p \times (-2)$

$\Rightarrow a^3 + p^3 - 8 = -6ap$

$\Rightarrow a^3 + 6ap + p^3 - 8 = 0$

29. $Y = 25 + 14(x-1) \Rightarrow y = 25 + 14x - 14 \Rightarrow \boxed{y=14x+9}$

Take any two points such as $(x=0 \Rightarrow y=9)$ and $(x=-1 \Rightarrow y=-5)$

on the graph paper take distance along x-axis and fare (in ₹) along y-axis.

Now, plot the points A(0, 9) and B(-1, -5) on

the graph paper

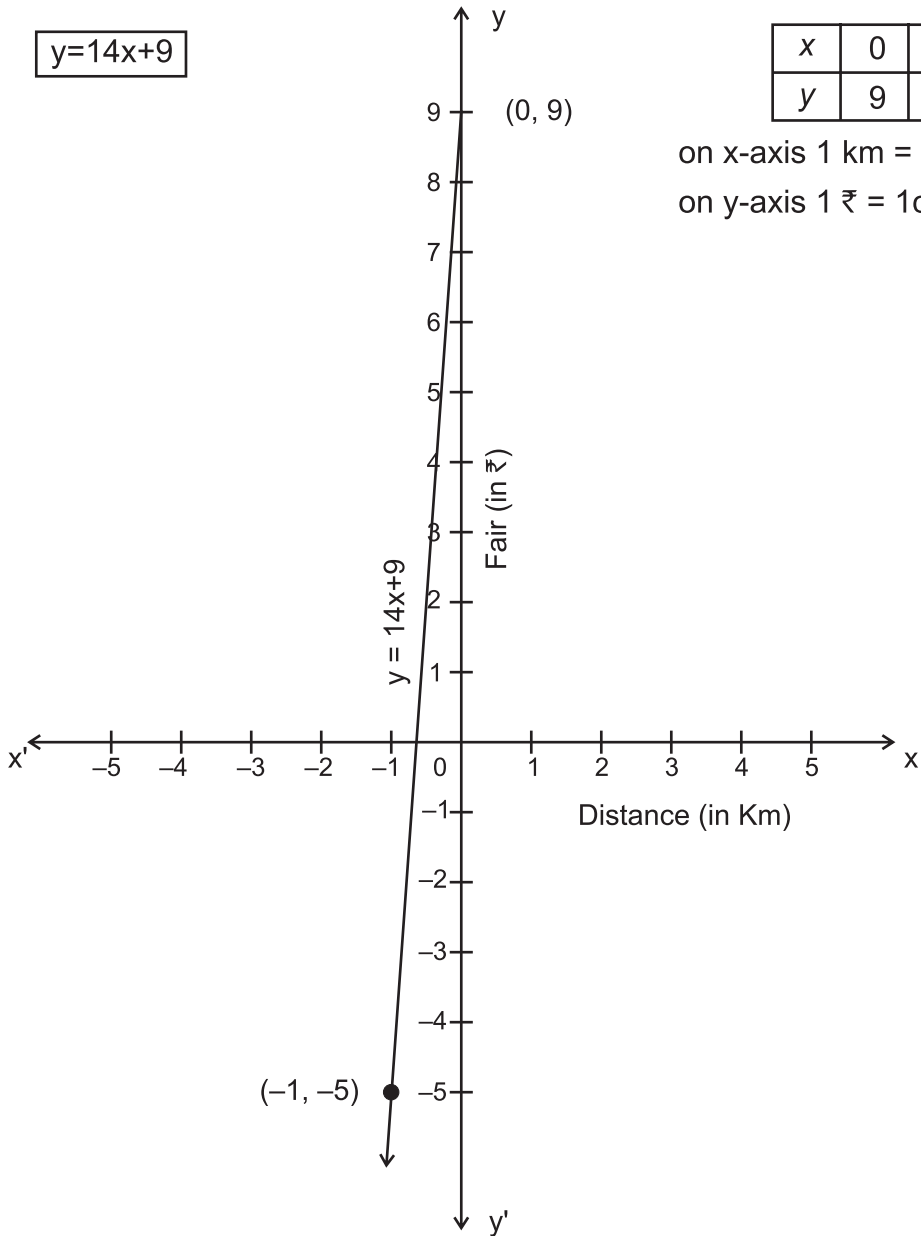
x	0	-1
y	9	-5

Join AB and produce it on both side to obtain the required graph.

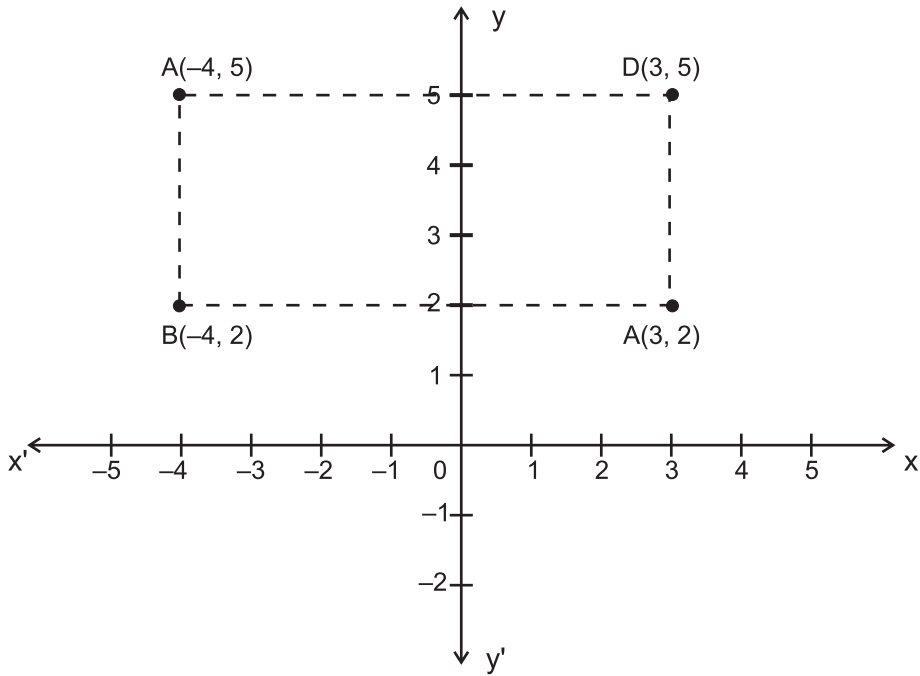
$$y = 14x + 9$$

x	0	-1
y	9	-5

on x-axis 1 km = 1cm
on y-axis 1 ₹ = 1cm



30. Plot the three vertices of the rectangle as $A(3, 2)$, $B(-4, 2)$, $C(-4, 5)$. To find the coordinate of the fourth vertex D . Since $ABCD$ is a rectangle. The opposite sides of a rectangle are equal. So the abscissa of D should be equal to abscissa of A . i.e. 3 and the ordinate of D should be equal to ordinate of C . i.e. 5. So the coordinates of D are $(3, 5)$.



31. Prove that the sum of the three angles of a triangle is 180° .

or

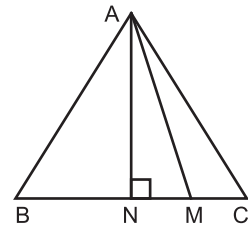
In a $\triangle ABC$, $\angle B > \angle C$, If AM is the bisector of $\angle BAC$ and $AN \perp BC$.

Prove that $\angle MAN = \frac{1}{2} (\angle B - \angle C)$

Given :- $\triangle ABC$, in which $\angle B > \angle C$, $AN \perp BC$

and AM is the bisector of $\angle A$

To prove : $\angle MAN = \frac{1}{2} (\angle B - \angle C)$



Proof : Since AM is the bisector of $\angle A \Rightarrow \angle MAB = \frac{1}{2} \angle A$ _____ (i)

In the right angle $\triangle ANB$

$\angle B + \angle NAB = 90^\circ \Rightarrow \angle NAB = 90^\circ - \angle B$ _____ (ii)

$\therefore \angle MAN = \angle MAB - \angle NAB = \frac{1}{2} \angle A - (90^\circ - \angle B)$
 $= \frac{1}{2} \angle A - \frac{1}{2} (\angle A + \angle B + \angle C) + \angle B$ [$\because \frac{1}{2} (\angle A + \angle B + \angle C) = 90^\circ$]

$= \frac{1}{2} (\angle B - \angle C)$

Hence $\angle MAN = \frac{1}{2} (\angle B - \angle C)$

$$\begin{aligned}
 32. \quad \text{We know that } (x+20)^\circ + (x-20)^\circ + (2x+5)^\circ + (2x-5)^\circ &= 360^\circ \\
 &= 6x &= 360^\circ \\
 x &= \frac{360^\circ}{6} \\
 x &= 60 \\
 \text{or}
 \end{aligned}$$

Draw $DP \parallel EF$

In $\triangle ADP$, E is the mid pint of AD and $EF \parallel DP$

\Rightarrow F is the mid point of AP

(By converse of mid point theorem)

in $\triangle FBC$, D is the mid point of BC and $DP \parallel BF$

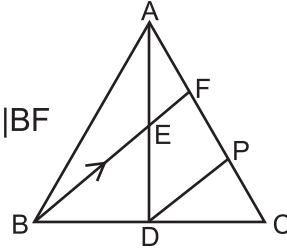
\therefore P is the mid point of FC

Then $AF = FP = PC$

$$AF + FP + PC = AC$$

$$AF + AF + AF = AC \Rightarrow 3AF = AC \Rightarrow AF = \frac{1}{3} AC$$

$$\text{Hence } AF = \frac{1}{3} AC$$



33. Given :- Two \parallel gms ABCD and ABEF on the same base AB and between the same parallel lines AB and FC.

To prove : ar (\parallel gm ABCD) = ar (\parallel gm ABEF)

Proof : In $\triangle ADF$ and $\triangle BCE$

$$AD = BC \quad (\text{opposite sides of } \parallel \text{ gm})$$

$$AF = BE \quad (\text{opposite sides of } \parallel \text{ gm})$$

$$\angle DAF = \angle CBE \quad (\because AD \parallel BC \text{ and } AF \parallel BE)$$

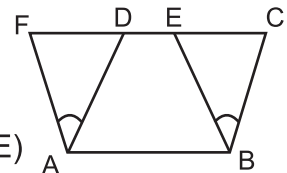
angle between AD and AF = angle between BC and BE

$$\therefore \triangle ADF \cong \triangle BCE \text{ (SAS Criteria)}$$

$$\therefore \text{ar} (\triangle ADF) = \text{ar} (\triangle BCE) \quad (i)$$

$$\begin{aligned}
 \therefore \text{ar} (\parallel \text{ gm ABCD}) &= \text{ar} (\square ABED) + \text{ar} (\triangle BCE) \\
 &= \text{ar} (\square ABED) + \text{ar} (\triangle ADF) \text{ using (i)} \\
 &= \text{ar} (\parallel \text{ gm ABEF})
 \end{aligned}$$

$$\text{Hence} \quad = \text{ar} (\parallel \text{ gm ABCD}) = \text{ar} (\parallel \text{ gm ABEF})$$



or

$$xy = \frac{1}{2}(a+b)$$

Let d be distance between AB and XY

then D is the distance between XY and DC.

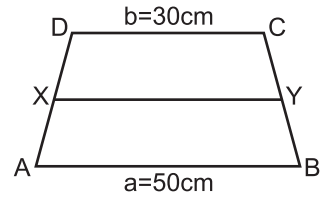
$$\text{ar (trap. ABXY)} = \frac{1}{2} \left(a + \frac{a+b}{2} \right) d = \frac{(3a+b)d}{4}$$

$$\text{ar (trap XYCD)} = \frac{1}{2} \left(\frac{a+b}{2} + b \right) d = \frac{(a+3b)d}{4}$$

$$\frac{\text{ar(trap xy)}}{\text{ar(trap XYBA)}} = \frac{\text{ar(DCYX)}}{\text{ar(XYBA)}} = \frac{\frac{(3a+b)d}{4}}{\frac{(a+3b)d}{4}}$$

$$\frac{\text{ar(DCYX)}}{\text{ar(XYBA)}} = \frac{a+3b}{3a+b} = \frac{50+3 \times 30}{3 \times 50+30} = \frac{50+90}{150+30} = \frac{140}{180} = \frac{7}{9}$$

$$\therefore \text{ar (DCYX)} = \frac{7}{9} \text{ar (XYBA)}$$



34. In $\triangle OEC$

$$\angle EOC = 180^\circ - (90^\circ + 30^\circ) = 180^\circ - 120^\circ = 60^\circ$$

$$\therefore \angle COD = 90^\circ - 60^\circ = 30^\circ$$

$$\angle CBD = \frac{1}{2} \angle COD = \frac{1}{2} \times 30^\circ = 15^\circ$$

$$\Rightarrow y = 15^\circ \quad [\because \angle CBD = y]$$

$$\text{Again } \angle ABD = \frac{1}{2} \angle AOD = \frac{1}{2} \times 90^\circ = 45^\circ$$

$$\text{and } \angle ABC = \angle ABD + y = 45^\circ + 15^\circ = 60^\circ = \angle ABE$$

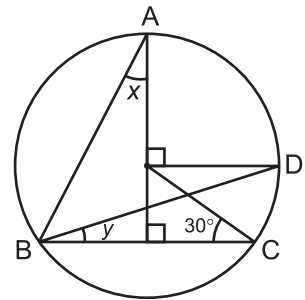
In $\triangle ABE$

$$\angle BAE = 180^\circ - (90^\circ + \angle ABE) = 180^\circ - (90^\circ + 60^\circ)$$

$$x = \angle BAE = 180^\circ - 150^\circ = 30^\circ$$

$$\Rightarrow x = 30^\circ$$

$$\text{Hence } x = 30^\circ \text{ and } y = 15^\circ$$



35. on Rationalising

$$\frac{1}{3-\sqrt{8}} = \frac{1}{(3-\sqrt{6})} \times \frac{(3+\sqrt{8})}{(3+\sqrt{8})} = \frac{3+\sqrt{8}}{(3)^2-(\sqrt{8})^2} = \frac{3+\sqrt{8}}{9-8} = \frac{3+\sqrt{8}}{1} = 3+\sqrt{8}$$

Similarly

$$\frac{1}{\sqrt{8}-\sqrt{7}} = \sqrt{8}-\sqrt{7}, \quad \frac{1}{\sqrt{7}-\sqrt{6}} = \sqrt{7}+\sqrt{6}, \quad \frac{1}{\sqrt{6}-\sqrt{5}} = \sqrt{6}+\sqrt{5}, \quad \frac{1}{\sqrt{5}-2} = \sqrt{5}+2$$

L.H.S.

$$\begin{aligned} & \frac{1}{(3-\sqrt{8})} - \frac{1}{(\sqrt{8}-\sqrt{7})} + \frac{1}{(\sqrt{7}-\sqrt{6})} - \frac{1}{(\sqrt{6}-\sqrt{5})} + \frac{1}{(\sqrt{5}-2)} \\ & (3-\sqrt{8}) - (\sqrt{8}-\sqrt{7}) + (\sqrt{7}-\sqrt{6}) - (\sqrt{6}-\sqrt{5}) + (\sqrt{5}+2) \\ & 3-\sqrt{8} - \sqrt{8}-\sqrt{7} + \sqrt{7}-\sqrt{6} - \sqrt{6}-\sqrt{5} + \sqrt{5}+2 \\ & 3+2 \\ & 5 \\ & = \text{R.H.S} \end{aligned}$$

36. $8x^3 + 27y^3 + 36x^2y + 54xy^2$

$$= (2x)^3 + (3y)^3 + 18xy(2x+3y) \quad [\because a^3+b^3+3ab(a+b)=(a+b)^3]$$

$$= (2x)^3 + (3y)^3 + 3(2x)(3y)(2x+3y)$$

$$= (2x+3y)^3 = (2x+3y)(2x+3y)(2x+3y)$$

37. i) $\angle B + \angle CBP = 180^\circ$ (Liner Pair)

$$\Rightarrow = \frac{1}{2}\angle B + \frac{1}{2}\angle CBP = 90^\circ$$

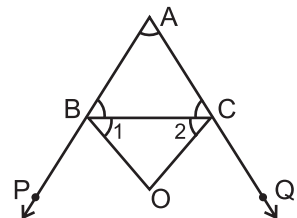
$$= \frac{1}{2}\angle B + \angle 1 = 90^\circ$$

$$= \angle 1 = 90^\circ - \frac{1}{2}\angle B$$

Again $\angle C + \angle BCQ = 180^\circ$

$$= \frac{1}{2}\angle C + \frac{1}{2}\angle BCQ = 90^\circ$$

$$= \frac{1}{2}\angle C + \angle 2 = 90^\circ$$



$$\Rightarrow \angle 2 = 90^\circ - \frac{1}{2} \angle C \quad \text{_____ (ii)}$$

In $\triangle BOC$ $\angle 1 + \angle 2 + \angle BOC = 180^\circ$ (Angle sum property of \triangle 's)

$$\angle BOC = 180^\circ - (\angle 1 + \angle 2) = 180^\circ - (90^\circ - \frac{1}{2} \angle B + 90^\circ - \frac{1}{2} \angle C)$$

$$\angle BOC = \frac{1}{2}(\angle B + \angle C) = \frac{1}{2}(\angle A + \angle B + \angle C) - \frac{1}{2} \angle A$$

$$= \frac{1}{2} \times 180^\circ - \frac{1}{2} \angle A \quad [\because \angle A + \angle B + \angle C = 180^\circ]$$

$$\angle BOC = 90^\circ - \frac{1}{2} \angle A$$

ii) In $\triangle ABC$

$\angle A + \angle B + \angle C = 180^\circ$ (Angle sum property \triangle 's)

$$\Rightarrow \frac{1}{2} \angle A + \frac{1}{2} \angle B + \frac{1}{2} \angle C = 90^\circ$$

$$\Rightarrow \frac{1}{2} \angle A + \angle 1 + \angle 2 = 90^\circ$$

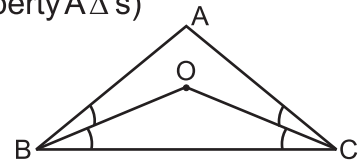
$$\Rightarrow \angle 1 + \angle 2 = (90^\circ - \frac{1}{2} \angle A) \quad \text{_____ (i)}$$

In $\triangle BOC$

$$(\angle 1 + \angle 2) + \angle BOC = 180^\circ$$

$$(90^\circ - \frac{1}{2} \angle A) + \angle BOC = 180^\circ$$

$$\angle BOC = 90^\circ + \frac{1}{2} \angle A$$



Using equation (i)

or

Given :- A point D on side BC of a $\triangle ABC$ such that

$$\angle BAD = \angle CAD$$

and $AD = CD$

To prove :- $AB = AC$

Construction :- Produce AD to a point E such that

$AD = DE$ and Join EC

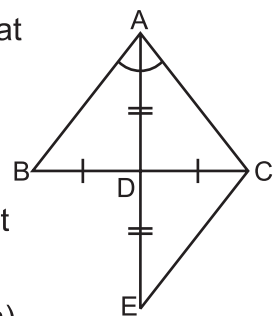
Proof : In $\triangle ABD$ and $\triangle ECD$

$BD = CD$ (Given)

$AD = ED$ (By construction)

$\angle ADB = \angle EDC$ (V.O.A.)

$\Rightarrow \triangle ABD \cong \triangle ECD$ (SAS)



$$\left. \begin{array}{l} \text{So, } AB = EC \\ \text{and } \angle BAD = \angle CED \end{array} \right\} \text{(CPT) } \underline{\hspace{2cm}} \text{ (i)}$$

$$\text{Also } \angle BAD = \angle CAD \text{ (Given) } \underline{\hspace{2cm}} \text{ (ii)}$$

From (i) and (ii)

$$\angle CAD = \angle CED$$

$$\Rightarrow AC = EC \text{ [side opposite to equal angles] } \underline{\hspace{2cm}} \text{ (iii)}$$

From (i) and (iii)

$$\left. \begin{array}{l} AB = EC \\ AC = EC \end{array} \right\} \Rightarrow AB = AC$$

Hence $\triangle ABC$ is isosceles.

39. The volume of the sphere = $\frac{4}{3} \pi r^3$

10% increase in radius = 10% r

Increase radius = $r + \frac{1}{10} r = \frac{11}{10} r$

the volume of the sphere now becomes

$$= \frac{4}{3} \pi \left(\frac{11}{10} r \right)^3 = \frac{4}{3} \pi \times \frac{1331}{1000} r^3$$

$$= \frac{4}{3} \pi \times 1.331 r^3$$

$$= \frac{4}{3} \pi \times 1.331 r^3 - \frac{4}{3} \pi r^3 = \frac{4}{3} \pi r^3 (1.331 - 1)$$

$$= \frac{4}{3} \pi r^3 \times 0.331$$

$$\% \text{ increase in volume} = \frac{\frac{4}{3} \pi r^3 \times 0.331}{\frac{4}{3} \pi r^3} \times 100\% = 33.1\%$$

or

$$\frac{\text{C.S.A.}}{\text{T.S.A.}} = \frac{2\pi rh}{2\pi r(h+r)} = \frac{1}{2}$$

$$\Rightarrow \frac{h}{h+r} = \frac{1}{2}$$

$$\Rightarrow h + r = 2h \Rightarrow h = r$$

$$\text{T.S.A.} = 2\pi r(h+r) = 616 = 2\pi r(r+r) = 616$$

$$= 2\pi r \times 2r = 616 \Rightarrow 4\pi r^2 = 616$$

$$= 4 \times \frac{22}{7} \times r^2 = 616 \times \frac{7}{88} \Rightarrow r = 7 = h$$

$$\text{Volume of cylinder} = \pi r^2 h = \frac{22}{7} \times 7 \times 7 \times 7 = 1078 \text{ cm}^3$$

$$\text{Volume of cylinder} = 1078 \text{ cm}^3$$

40. Let number of boys = x, number of girls = y

Total marks obtained by boys = 70x

Total marks obtained by girls = 73y

Total marks obtained by both = 71(x+y)

$$\therefore 70x + 73y = 71(x+y)$$

$$\Rightarrow 73y - 71y = 71x - 70x$$

$$\Rightarrow 2y = x \Rightarrow \frac{x}{y} = \frac{2}{1} \Rightarrow x:y = 2:1$$

or

Mean of item = 64

Total items = 100

Num. of items = 64 × 100 = 6400

Correct new sum of items = 6400 - (26+9) + (36+90)

= 6400 - 35 + 126

\therefore Correct new sums of items = 6400+91=6491

\therefore Correct mean = $\frac{6491}{100} = 64.91$

PRACTICES QUESTION PAPER - 2
CLASS-IX
MATHEMATICS

Time: 3 Hrs.**M.M. 80****General Instruction:**

1. All questions are compulsory.
2. The question paper consists of 40 questions and it is divided into four section A, B, C and D.
3. Section A comprises of 20 question carrying 1 mark each.
4. Section B comprises of 6 question carrying 2 mark each.
5. Section C comprises of 8 question carrying 3 mark each.
6. Section D comprises of 6 question carrying 4 mark each.
7. There is no overall choice in the paper. However an internal choice has been provided into 2 question of 2 marks, 4 questions of 3 marks and 3 questions of 4 marks. You have to attempt only one of the alternatives in all such questions.
8. Use of calculator is not permitted.

PART – A

1. Which of the following is the formula for the volume of the sphere ?
 - a) $\frac{1}{3}\pi r^3$
 - b) $\frac{2}{3}\pi r^3$
 - c) πr^3
 - d) $\frac{4}{3}\pi r^3$
2. If $x=0$ and $y=k$ are the solutions of the equation $5x-3y=3$, the value of K is :
 - a) $\frac{3}{2}$
 - b) 0
 - c) -1
 - d) $-\frac{2}{3}$
3. The class mark of the interval 100 – 120 is :
 - a) 100
 - b) 110
 - c) 120
 - d) 20

4. How many triangle are possible having angles 60° , 90° and 30° ?
 - a) only one
 - b) None
 - c) Infinite
 - d) only 3

5. Which of the following is true if $\Delta PQR \cong \Delta SET$?
 - a) $PQ = SE$
 - b) $QR = ST$
 - c) $\angle P = \angle T$
 - d) $PR = SE$

6. Which of the following is a rational number ?
 - a) 0.123456....
 - b) $\sqrt{23}$
 - c) $\sqrt{36}$
 - d) $2\sqrt{3}$

7. The base and height of a parallelogram are 10cm and 6cm respectively. The area of parallelogram is :
 - a) 30cm^2
 - b) 60cm^2
 - c) 16cm^2
 - d) 8cm^2

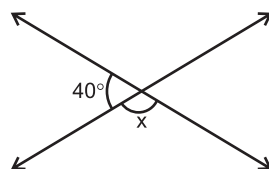
8. The probability of getting a factor of 6 on throwing a dice is :
 - a) $\frac{2}{3}$
 - b) $\frac{1}{3}$
 - c) $\frac{1}{6}$
 - d) $\frac{3}{2}$

9. The angle of the semicircle is :
 - a) 120°
 - b) 60°
 - c) 180°
 - d) 90°

10. Which quadrant has both ordinate and abscissa negative ?
 - a) I
 - b) II
 - c) III
 - d) IV

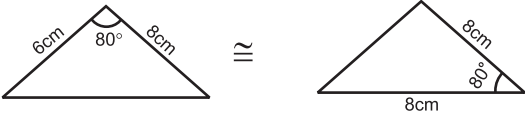
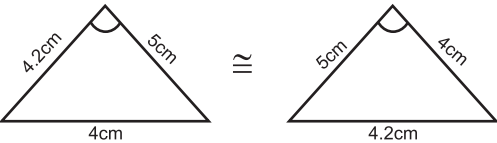
11. Find the value of C if in a triangle $S=13$, $a=8$, and $b=7$.

12. Find the value of x from the following figure.



13. Find the decimal expansion of $\frac{31}{16}$.
14. If $(x-1)$ is a factor of the polynomial $2x^2 - 2a$ then find the value of a .
15. If the median of 6, 4, 7, 13 and p is 8 then find the value of p .

Match the following

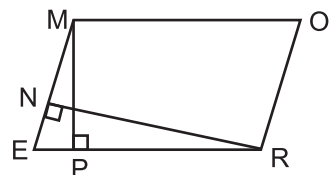
16.  i) 9
17. Distance of point $(4, 9)$ from x-axis ii) 25°
18.  iii) 115°
19. Mode of data 4, 9, 5, 4, 9, 5, 4, 5, 9, 5 iv) SAS Congruency
20. Supplementary angle of 65° v) 5

PART B

21. Find any two solutions of the equation $4x + 3y = 12$.
22. If each side of triangle is doubled then find the ratio of area of new triangle thus formed and the given triangle.

or

In the figure, MORE is a parallelogram and $RN \perp ME$ and $MP \perp ER$. if $MO=16\text{cm}$, $MP=8\text{cm}$ and $RN=10\text{cm}$ then find the value of ME .



23. The volume of a right circular cone is 9856cm^3 . If the radius of the base is 14 cm then find the height of the cone. (Use $\pi = 22/7$)
24. Solve : $(625)^{0.06} \times (625)^{0.19}$

25. Factorize : $(p-q)^3 + (q-r)^3 + (r-p)^3$

or

If $p(x) = x+5$ then find the value of $p(x) + p(-x)$

26. The side of cube is 8cm. Find the lateral surface area of the cube.

PART – C

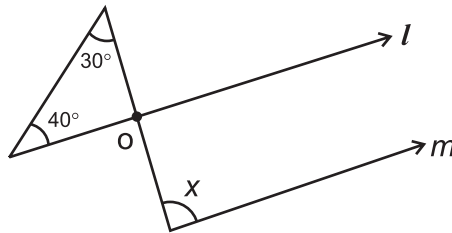
27. A dice is thrown 80 times. If the probability of having an even number is $\frac{7}{10}$ then how many times an odd number appears on dice ?

28. The cost of four chairs and five tables is ₹ 3200. Write a linear equation in two variables for this statement and find out its two solutions.

or

Solve for x : $(5x+1)(x+3) - 8 = 5(x+1)(x+2)$

29. In the given figure if $l \parallel m$ then find the value of x .



30. The sides of a triangle are in the ratio 11:19:24 and its perimeter is 540cm. Find the area of the triangle.

or

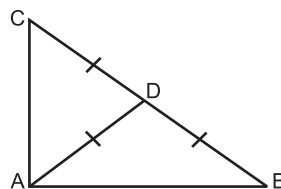
The side of a triangle shaped sheet are 5cm, 12cm and 13cm. Find the cost of painting on the sheet at the rate of ₹ 30 per cm^2 .

31. Divide the polynomial $9x^3 - 3x^2 + 15x - 3$ by $(3x - 1)$ and find its quotient and remainder.

32. Prove that the angle opposite to the equal sides of an equilateral triangle are equal.

or

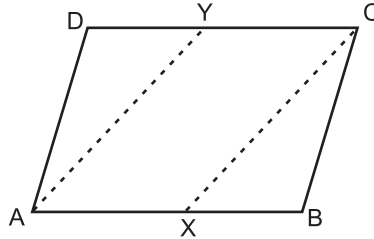
In the given figure, $AD = BD = CD$. Find $\angle BAC$.



33. In a rhombus ABCD, $\angle ABC = 72^\circ$. Find $\angle ACD$

or

In the figure ABCD is a parallelogram x and y are mid-point of sides AB and DC. Prove that AXCY is a parallelogram.



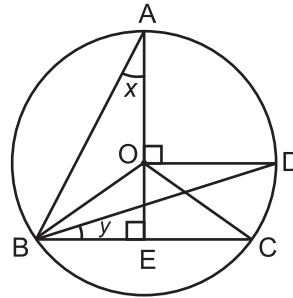
PART – D

35. Prove that the angle subtended by an arc at the centre is double the angle subtended by it at any point on the remaining part of the circle.

or

In the given figure, O is the centre of the circle and $\angle BCO = 30^\circ$.

Find the value of x and y.



36. Draw the frequency polygon for the following distribution.

Marks	No. of Students
0-10	7
10-20	10
20-30	6
30-40	8
40-50	12
50-60	3
60-70	2
70-80	2

or

Find the mean, median and mode for the following distribution.

75, 62, 88, 55, 90, 95, 85, 59, 72, 78, 90, 95, 90, 95, 80, 71, 44, 57, 68, 90.

37. Construct a triangle having perimeter 6.4 cm and its basic angle are 60° and 45° .
38. The inner diameter of a cylindrical wooden pipe is 24cm and its outer diameter is 28cm - The length of this pipe is 35cm. Find the mass of the pipe if 1cm^3 of wood has a mass of 0.6 gram.
39. Simplify :
$$\frac{(361)^3 + (139)^3}{(361)^2 - (361 \times 139) + (139)^2}$$

or

Express $0.\overline{245}$ in the form $\frac{p}{q}$.

40. If $(x+a)$ is a factor of the polynomials (x^2+px+q) and (x^2+mx+n) then prove that

$$a = \frac{n - q}{m - p}$$

SOLUTION
PRACTICE QUESTION PAPER - 2

- | | |
|---|--|
| <p>1. d) $\frac{4}{3}\pi r^3$</p> <p>2. c) -1</p> <p>3. b) 110</p> <p>4. c) Infinite</p> <p>5. a) PQ = SE</p> <p>6. c) $\sqrt{36}$</p> <p>7. b) 60cm^2</p> <p>8. a) $\frac{2}{3}$</p> <p>9. d) 90°</p> <p>10. c) III</p> <p>11. C = 11</p> <p>12. x = 140°</p> <p>13. 1.9375</p> <p>14. a = 1</p> <p>15. p = 10</p> <p>16. iv) SAS</p> <p>17. i) 9</p> <p>18. vi) SSS</p> <p>19. v) 5</p> <p>20. iii) 115°</p> <p>21. Any two solutions</p> <p>22. 4 : 1 or ME = 12.8cm</p> <p>23. h = 48cm</p> <p>24. 5</p> <p>25. $3(p-q)(q-r)(r-p)$ or 5</p> <p>26. 256cm^3</p> <p>27. 24 times</p> | <p>28. No. of chair = x
No. of table = y
$4x + 5y = 3200$
Any two solution
or
x = 15</p> <p>29. x = 70°</p> <p>30. $7200\sqrt{2}\text{ cm}^2$
or
Area = 30cm^2
Cost = ₹ 900</p> <p>31. Quotient = $3x^2+5$
Remainder = 2</p> <p>32. $\angle BAC = 90^\circ$</p> <p>33. Non-collinear</p> <p>34. $\angle ACD = 54^\circ$</p> <p>35. x = 30°
y = 15°</p> <p>36. Means = 76.95
Median = 79
Mode = 90</p> <p>38. 3432gm
3.432 kg</p> <p>39. 500
or
$\frac{245}{999}$</p> |
|---|--|

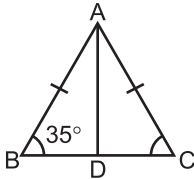
PRACTICES QUESTION PAPER - 3
CLASS-IX
MATHEMATICS

Time: 3 Hrs.**M.M. 80****General Instruction:**

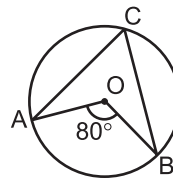
1. All questions are compulsory.
2. The paper consists of 40 questions divided into four sections A, B, C and D. Section A comprises of 20 questions of 1 marks each. Section B comprises of 6 question of 2 marks each. Section C comprises of 8 questions of 3 marks each. Section D comprises of 6 question of 4 marks each.
3. There is no over all choice in this question paper. All though internal choices has been provided in some question.

SECTION - A

1. A national number $\frac{5}{7}$ is equivalent to
 - a) $\frac{15}{17}$
 - b) $\frac{25}{27}$
 - c) $\frac{10}{14}$
 - d) $\frac{10}{27}$
2. The zero of the polynomial $p(x) = 2x+5$ is
 - a) 2
 - b) $\frac{2}{5}$
 - c) 5
 - d) $-\frac{5}{2}$
3. The polynomial of type ax^2+bx+c , when $a=0$
 - a) Linear
 - b) Quadratic
 - c) Cubic
 - d) Biquadratic
4. Through which of the following point, the graph of $y = -x$ passes?
 - a) (1, 1)
 - b) (0, 1)
 - c) (-1, 1)
 - d) (0, 0)

5. Graph of which question is parallel to x -axis ?
 - a) $y = x+1$
 - b) $y = 2$
 - c) $x = 3$
 - d) $x = 2y$
 6. What is the measure of an angle whose measure is 32° less than its supplement ?
 - a) 148°
 - b) 60°
 - c) 74°
 - d) 55°
 7. If $\angle P$ and 100° form a linear pair. What is the measure of $\angle P$.
 - a) 80°
 - b) 180°
 - c) 120°
 - d) 75°
 8. In the given figure AD is the median then $\angle BAD$ is
 - a) 70°
 - b) 55°
 - c) 110°
 - d) 35°
- 
9. In two triangles ABC and DEF, $AB = DE$, $BC = DF$ and $AC = EF$ then
 - a) $\triangle ABC \cong \triangle DEF$
 - b) $\triangle ABC \cong \triangle FED$
 - c) $\triangle ABC \cong \triangle EDE$
 - d) None of these
 10. If $P(E) = 0.37$ then $P(\text{Not } E)$ will be
 - a) 0.37
 - b) 0.74
 - c) 0.57
 - d) 0.63
 11. The radius of hemisphere is " r " what is its total surface area.
 - a) $\frac{2}{3}\pi r^3$
 - b) $3\pi r^2$
 - c) $2\pi r^2$
 - d) $\frac{4}{3}\pi r^2$
 12. The sides of a triangle are in the ration 3 : 4 : 5. If its perimeter is 36cm. Then what is its area ?
 - a) 72cm^2
 - b) 67cm^2
 - c) 32cm^2
 - d) 54cm^2
 13. The mean of 5 numbers is 30. If one number is excluded their mean becomes 28. What is excluded number.
 - a) 38
 - b) 35
 - c) 32
 - d) 36

14. In the given figure if O is the centre of a circle, then measure of $\angle ACB$ is

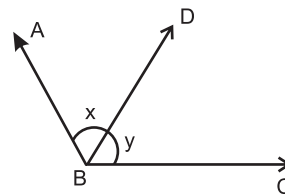


- a) 80° b) 40°
 c) 160° d) 35°

15. In $\triangle ABC$, $AB = AC$ and $\angle B = 65^\circ$ then $\angle C$ is equal to

- a) 130° b) 32°
 c) 70° d) 65°

16. For what value of $x+y$ in given figure ABC be a line? justify y-axis answer.



17. How many linear equations is x and y can be satisfied by $x=1$ and $y=2$?

18. Fill in the blank

An arc is a _____ when its ends are the ends of a diameter.

19. Write the class size of 0–4, 5–9, 10–14

* Write the class limits in 10.4, 11.4, 12.4

20. Two parallelograms are on same base and between same parallels. The ratio of their areas is 1:1 (True/False)

or

A median of a triangle divide it in to triangle of equal area (True/False)

SECTION - B

21. Find the value of the polynomial $5x-4x^2+3$ at

- a) $x = 0$ b) $x = 2$

22. Write any two solution of the equation $\pi x + y = 9$.

23. If the base of a parallelogram is 8cm and its altitude is 5cm. then find its area ?

24. Write the co-efficient of x^2 in each of following

- i) $2 - x^2 + x$ ii) $\sqrt{2}x - 1$

or

Find the product without multiplying directly 107×93

25. The total surface area of a cube is 150cm^2 . Find the perimeter of any one of its faces ?
26. Find the ratio of total surface area of a sphere and a hemisphere of same radius ?

or

Find the curved surface area of a cone whose height is 12cm and base radius is 5cm ?

SECTION – C

27. Two coins are tossed simultaneously 500 times and we get
two heads = 105 times
one heads = 275 times
No heads = 120 times

Find the probability of each of these events ?

28. Give the geometric representation of $2x+9=0$ as an equation.
i) In one variable ii) in two variables
29. Construct a triangle ABC in which $BC=8\text{cm}$ $\angle B=45^\circ$ and $AB-AC=3.5\text{cm}$.
30. Prove that equal chords of a circle subtend equal angles at the centre.

or

If the non parallel sides of a trapezium are equal. Prove that it is cyclic.

31. Draw the graph of following linear equation in two variables $x+y=4$

or

If $x=3k-2$ and $y=2k$ is a solution of equation $4x-7y+12=0$ then find the value of K.

32. ABCD is a rectangle and P, Q, R and S are mid points of the sides AB, BC, CD and DA respectively. Show that the quadrilateral PQRS is a rhombus.

or

In a triangle ABC, D, E and F are respectively mid points of sides AB, BC and AC. Show that $\triangle ABC$ is divided into four congruent triangles by joining D, E and F.

33. Simplify the given expression $(5 + \sqrt{7})(2 + \sqrt{5})$
34. The sides of a triangle shaped sheet are 5cm, 12cm and 13cm. Find the cost of painting on the sheet at the rate of ₹ 30 per cm^2 ?

SECTION-D

35. Given below is the data of students who participated in different activities.

Activity	Sports	Meditation	Yoga	Wacking
No. of Girls	40	35	100	120

Draw the bar graph for the given date.

or

If $x+y+z=0$ show that

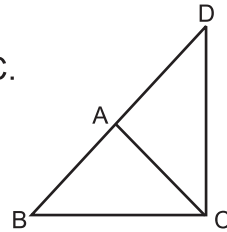
$$x^3 + y^3 + z^3 = 3xyz$$

37. Rationalise the denominator $\frac{5}{\sqrt{3} - \sqrt{5}}$

or

Express 0.3178 is the form of $\frac{p}{q}$ where p and q are _____ and $q \neq 0$.

38. ΔABC is an isosceles triangle in which $AB=AC$. Side BA is produced to D such that $AD=AB$. Show that $\angle BCD$ is a right angle.

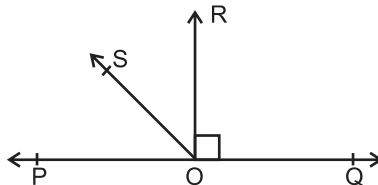


or

Prove that

In a right angle triangle, the hypotenuse is the longest side.

- 39.



In the given figure POQ is a straight line . $RO \perp PQ$. SO is a ray from O then prove that $\angle ROS = \frac{1}{2} (\angle QOS - \angle POS)$

40. A godown measures $40\text{m} \times 25\text{m} \times 15\text{m}$. Find the maximum number of wooden boxes each measuring $1.5\text{m} \times 1.25\text{m} \times 0.5\text{m}$ that can be stored the godown.

or

The value of right circular cone is 9856 cm^3 . If the diameter of base is 20cm . Find

- i) Slant height
- ii) Height of the cone.
- iii) Curved surface area of the cone.

SOLUTION
PRACTICE QUESTION PAPER - 3

- | | |
|--|--|
| <p>1. c) 10/14</p> <p>2. d) $-5/2$</p> <p>3. a) linear</p> <p>4. c) $(-1, 1)$</p> <p>5. b) $y = 2$</p> <p>6. c) 74°</p> <p>7. a) 80°</p> <p>8. b) 55°</p> <p>9. c) $\triangle ABC \cong \triangle EDF$</p> <p>10. d) 0.63</p> <p>11. b) $3\pi r^2$</p> <p>12. d) 54cm^2</p> <p>13. a) 38</p> <p>14. b) 40°</p> <p>15. d) 65°</p> <p>16. $x + y = 180^\circ$</p> <p>17. Infinitely many</p> <p>18. Semi circle</p> <p>19. 5 or 9.9, 10.9, 11.9</p> <p>20. True or False</p> <p>21. i) 3 ii) -3</p> <p>22. Any two solutions</p> <p>23. 40cm^2</p> <p>24. $-1, 0$ or</p> <p style="padding-left: 20px;">$9951[\text{using}(100+7)\times(100-7)]$</p> <p>25. 20 cm</p> | <p>26. 4:3 or 204.28cm^2</p> <p>27. i) $P(2 \text{ head}) = 21/100$
ii) $P(\text{one head}) = 11/20$
iii) $P(\text{no head}) = 6/25$</p> <p>28. Correct representation,
$x = -9/2$</p> <p>29. Correct construction</p> <p>30. Correct proof or
Correct proof</p> <p>31. Correct graph for
$x+y=4$ or $k=2$</p> <p>32. correct proof</p> <p>33. $10 + 5\sqrt{5} + 2\sqrt{7} + \sqrt{35}$</p> <p>34. ₹ 900</p> <p>35. Correct draw of bar graph</p> <p>36. $0 \times [x^2+y^2+z^2-xy-yz-zx] = 0$</p> <p>37. $-5/2(\sqrt{3}+\sqrt{5})$ or
$3175/9990$</p> <p>38. Correct proof</p> <p>39. Correct proof</p> <p>40. 16000
or
i) 50cm
ii) 48cm
iii) 2200cm^2</p> |
|--|--|