GSEB Class 9 Maths Sample Paper -Set 2 Answers

Section - A

1. $4x^2 + 14 + 8x - 16 + 7x^2 - 2x$

$= 11x^2 + 6x - 2$

2. $4x^2 - 9x + 12 \; at \; x = -1$

$= 4(-1)^2 - 9(-1) + 12$
$= 4 + 9 + 12 = 25.$

3. $Given \angle X = 45°, \angle Y = 75°.$
$\angle X + \angle Y + \angle Z = 180°$
$45° + 75° + \angle Z = 180°$
$120 \circ + \angle Z = 180°$
$\angle Z = 180° - 120°$
$\angle Z = 60°$

OR

Area of an equilateral triangle $= \frac{\sqrt{3}}{4} S^2$
Side of the triangle $= 15 \; cm$
Area of the triangle $= \frac{\sqrt{3}}{4} (15)^2$
$= \frac{\sqrt{3}}{4} (225)$
Area of the equilateral triangle $= 97.4 \; cm^2$

4. $\frac{3x}{4} + \frac{x}{2} = \frac{5}{8}$

$\frac{3x+2x}{4} = \frac{5}{8}$

$\frac{5x}{4} = \frac{5}{8}$

$8 \; (5x) = 20$

$x = \frac{1}{2}$

5. Range = max value - min value

Range = $786 - 45 = 741$

OR

Data : 23,76,85,49,33
Arrange them in ascending order
23,33,49,76,85
Median = 49.

6. Area of a triangle $= \frac{1}{2} \times base \times height$

$21 = \frac{1}{2} \times b \times 7$
$42 = 7b$
$B = \frac{42}{7} = 6\,cm.$

Section –B

7. If $\frac{x}{4} - \frac{x-3}{6} = 2$

$\frac{3x-2x+6}{12} = 2$
$x + 6 = 24$
$x = 18$

OR

$\frac{a}{3} = \frac{b}{4} = \frac{c}{5} = x$

Then $a = 3x, b = 4x, c = 5x$
$\frac{a+b+c}{a} = \frac{3x+4x+5x}{3x} = \frac{12x}{3x} = 4$

8. $95x^2y - 19x^2y^2 = 19x^2y(5-y)$

9. The points lie in

a) $(-5,-6) = III\ Quadrant$

b) $(7,9) = I\ Quadrant$

c) $(-3,6) = II\ Quadrant$

d) $(4,9) = I\ Quadrant$

10. $\Delta OPS\ and\ \Delta OQR$, we have $PS \| QR$ intersecting at O

$And\ QS$ intersects them.

Hence by alternate angles, $\Delta OSP = \Delta OQR$

Similarly, $\Delta OPS = \Delta ORQ$

11. $Area\ of\ a\ parallelogram = base \times height$

$20 = 5 \times h$
$Height = 4cm.$

OR

Let the common ration between the angles be x.
Sum of angles of a quadrilateral be $360°$.
$5x + 4x + 2x + 1x = 360°.$
$12x = 360°.$
$X = 30°.$
The angles are $150°, 120°, 60°, 30°$

12. Area of the trapezium
$= \frac{1}{2} \times (sum\ of\ parallel\ sides) \times (distance\ between\ them)$
$= \left\{\frac{1}{2} \times (30 + x) \times 20\right\} cm^2$
$= \left\{\frac{1}{2} \times (600 + 20x)\right\} cm^2$
$840 = 300 + 10x$
$10x = 840 - 300$
$10x = 540$
$x = 54.$

Section – C

13. $\frac{(512)^{\frac{2}{3}} \times (1296)^{\frac{3}{4}}}{(32)^{\frac{3}{5}} \times (25)^{\frac{3}{2}} \times (225)^{\frac{1}{2}}}$

$= \frac{(8)^{(3)\frac{2}{3}} \times (6)^{(4)\frac{3}{4}}}{(2)^{(5)\frac{3}{5}} \times (5)^{(2)\frac{3}{2}} \times (5)^{(2)\frac{1}{2}}}$

$= \frac{(8)^{(2)} \times (6)^{(3)}}{(2)^{(3)} \times (5)^{(3)} \times 5}$

$= \frac{64 \times 216}{8 \times 125 \times 5}$

$= \frac{1728}{625}$

14. By using factor theorem, $(x-2)$ is a factor only when $p(2) = 0$

$p(2) = 2^4 - 2(2)^2 - 5(2) + 2$

$= 16 - 8 - 10 + 2$

$= 0.$

15. In parallelogram ABCD, AD is produced to E and BE is joined such that BE intersects CD at F.
Now, in ΔABE and ΔCFB
$\angle BAE = \angle FCB$ because opposite angles of a parallelogram are always equal
$\angle AEB = \angle CBF$ because of parallel sides

Now, using AA similarity, we have
$\Delta ABE \sim \Delta CFB$.
Hence proved.

OR

Given $\angle Q < \angle R$,
Hence $\angle R > \angle Q$
Therefore $OQ > OP$ ...(1)
Similarly, $OR > OS$ ....(2)
From (1) and (2), we have $(OQ + OR) > (OP + OS)$
$QR > PS \text{ or } PS < QR$

16. (i) $f(2) = x^3 - 3x^2 + kx - 2$
$f(2) = 2^3 - 3(2)^2 + k(2) - 2$
$0 = 8 - 12 + 2k - 2$
$0 = 2k - 6$
$K = 3$
(ii) $f(x) = 2x^3 - kx^2 - 5x + 6$
$f(2) = 2(2)^3 - k(2)^2 - 5(2) + 6$
$0 = 16 - 4k - 10 + 6$
$0 = 12 - 4k$
$K = 3$

17. PS is the perpendicular bisector of QR, hence $QS = SR$.

In $\Delta PQS = \Delta PRS$

$PS = PS$

$\angle PSQ = \angle PSR = 90^\circ$ since PS is the perpendicular bisector of QR.

By SAS Criteria, $\Delta PQS = \Delta PRS$. Their corresponding parts are equal.

$PQ = PR$. Thus ΔPQR is an isosceles triangle.

18. $Total\ no\ of\ balls = 16$

No of ways of drawing two balls out of $16 = {}^{16}C_2 = \frac{16\times15}{2} = 120$.

Let A be the event of drawing two balls of same colour, $n(A) = {}^{8}C_2 + 8_{C_2} = 2 \times \frac{8\times7}{2} = 56$

$P(E) = \frac{n(E)}{n(S)} = \frac{56}{120} = \frac{7}{15}$

19. $In\ \Delta ABC\ and\ \Delta QRP$

$\frac{AB}{QR} = \frac{2}{4} = \frac{1}{2}$

$\frac{BC}{RP} = \frac{2.5}{5} = \frac{1}{2}$

$\frac{CA}{PQ} = \frac{3}{6} = \frac{1}{2}$

Hence $\frac{AB}{QR} = \frac{BC}{RP} = \frac{CA}{PQ}$

Using SSS Similarity ΔABC is similar to ΔQRP.

OR

$In\ \Delta ABC, \angle B = 90^o$.

M is the midpoint of AC and OM is parallel to BC

According to converse of midpoint theorem, O is the midpoint of AB.

Because the line OM is parallel to BC and M is the midpoint of AC, so O is definitely the midpoint of AB.

20. $ABCD$ is a rhombus, consecutive angles $\angle BCD\ and\ \angle ADC$ are supplementary.

So $\angle ADC + \angle BCD = 180^\circ$

$\angle BCD = 124^\circ$

$\angle ADC + 124^\circ = 180^\circ$

$\angle ADC = 56^\circ$.

A diagonal of a rhombus bisects the angles at its endpoints.

So $\angle ADB = 28^o$

21. Let the inner radius be r metres.

$2\pi r = 660,$

$r = \frac{660}{2\pi} = 105m$

Radius of outer circle $= 105 + 20 = 125\ m$

OR

Let the base of the parallelogram be a, and height be $2a$.

$Area\ of\ the\ parallelogram\ =\ base\ \times\ height\ =\ a\ \times\ 2a\ =\ 2a^2$

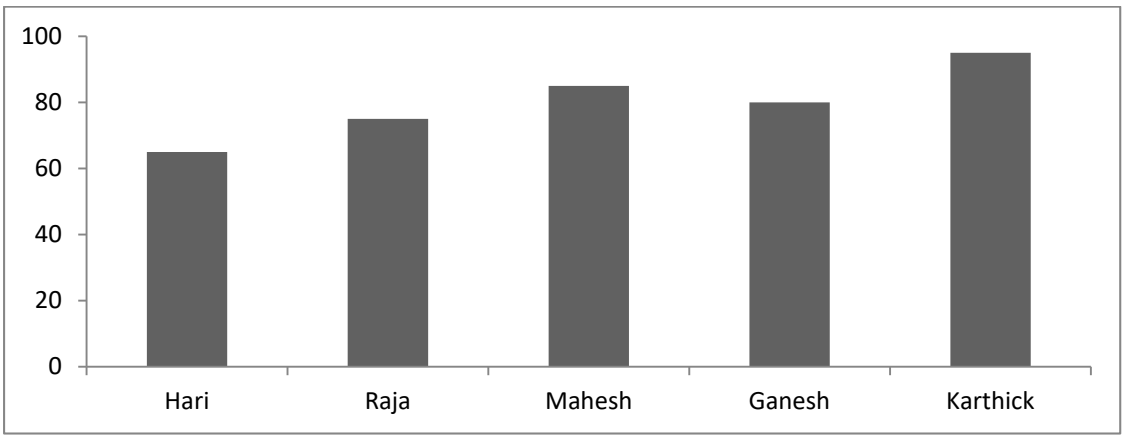
Area of the parallelogram $=\ 50$

$50\ =\ 2a^2$

$25\ =\ a^2$

$a\ =\ 5$, hence $base\ =\ 5cm, height\ =\ 5\times 2\ =\ 10\ cm.$

22. (i)



(ii) Mean = $\frac{65+75+85+80+95}{5}$ = 80.

OR

(i)

Test marks obtained	**No of students (frequency)**
03	1
09	1
12	3
13	1
22	3
33	1
36	1
40	2
54	3

66	2
78	1
96	1

ii) Range $= 96 - 3 = 93$.

SECTION – D

23. The value of $\frac{1}{3} + \frac{1}{2} + \frac{1}{4} + \frac{1}{6} + \frac{1}{12} + \frac{1}{24}$

$\rightarrow \frac{1}{3} + \frac{1}{2} + \frac{1}{4} + \frac{1}{6} + \frac{1}{12} + \frac{1}{24}$

$= \frac{8 + 12 + 6 + 4 + 2 + 1}{24}$

$= \frac{33}{24}$

$= \frac{11}{8}$.

24. Postulate 1: A straight line can be drawn from any point to another point
Postulate 2: A terminated line can be further produced indefinitely.

25. $(x + y)^2 = x^2 + y^2 + 2xy$

$(x + y)^2 = 117 + 2(54)$

$(x + y)^2 = 225$

$x + y = 15 \rightarrow (1)$

$(x - y)^2 = x^2 + y^2 - 2xy$

$(x - y)^2 = 117 - 2(54)$

$(x - y)^2 = 9$

$x - + y = 3 \rightarrow (2)$

$\frac{x-y}{x+y} = \frac{3}{15} = \frac{1}{5}$

OR

$\frac{3}{4}\left(1 + \frac{1}{3}\right)\left(1 + \frac{2}{3}\right)\left(1 - \frac{2}{5}\right)\left(1 + \frac{6}{7}\right)\left(1 - \frac{12}{13}\right)$

$= \frac{3}{4} \times \frac{4}{3} \times \frac{5}{3} \times \frac{3}{5} \times \frac{13}{7} \times \frac{1}{13}$

$= \frac{1}{7}$

26. We know that sum of exterior angles of a polygon = 360^°

$\therefore 125^\circ + 125^\circ + x^\circ = 360^\circ$

$\Rightarrow 250^\circ + x^\circ = 360^\circ$
$\Rightarrow x^\circ = 360^\circ - 250^\circ$
$\Rightarrow x^\circ = 110^\circ$

27. Surface area of cube $= 6 \times 52 = 150\ sq.ft$

Quantity of paint required $= \frac{150}{10} = 15Kg.$

Cost of 15 Kg of paint $= 15 \times 50 = Rs.750$

OR

$Volume\ of\ the\ cylindrical\ tank = \pi \times r^2 \times h$

$2512 = \pi \times r^2 \times 8$

$r^2 = \frac{2512}{25.12}$

$r^2 = 100, r = 10m.$

Diameter of the tank $= 10 \times 2 = 20m.$

28. We have $AD = 3.9\ cm,\ DB = 3\ cm, AE = 3.6\ cm,\ EC = 2.4\ cm.$

$For\ DE \parallel to\ BC,$

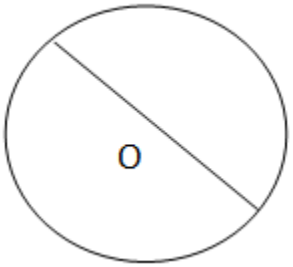
$\frac{AD}{DB} = \frac{3.9}{3} = 1.3\ cm$

$\frac{AE}{EC} = \frac{3.6}{2.4} = \frac{3}{2}\ cm$

$\frac{AD}{DB} \neq \frac{AE}{EC}.$

Hence$DE\ is\ not \parallel to\ BC.$

29



$\left(\frac{20}{2}\right)^2 = r^2 + \left(\frac{10}{2}\right)^2 r^2 = \left(\frac{20}{2}\right)^2 - \left(\frac{10}{2}\right)^2$

$r^2 = (10)^2 - (5)^2$

$r^2 = 75 = 8.66\ cm$

OR

Circumference of a circle $2\pi r$
Radius of the circle $= r$
Given $2\pi r - r = 42cm$
$r(2\pi - 1) = 42$
$r = \frac{42}{5.28}$
$r = 8.$
Area of the circle $= \pi r^2 = \pi \times 8 \times 8 = 201\ cm^2$

30. Substitute $x = 1$,
$3(1) + y = 2$
$y = 2 - 3$
$y = -1$

Substitute $x = 2$,
$3(2) + y = 2$
$y = 2 - 6$,
$y = -4$

Substitute $x = 3$,
$3(3) + y = 2$
$y = 2 - 9$,
$y = -7$

Substitute $x = 4$,
$3(4) + y = 2$

$y = 2 - 12,$
$y = -10$

The three solutions of the given equation are
1. $at\ x = 1, y = -1\ (i.e.)\ A(1, -1)$
2. $at\ x = 2, y = -4\ (i.e.)\ B(2, -4)$
3. $at\ x = 3, y = -7\ (i.e.)\ C(3, -7)$
4. $at\ x = 4, y = -10\ (i.e.)\ D(4, -10)$