B.K. Birla Centre For Education

Date: 17-12-2025 | PRE BOARD EXAMINATION-II | **Duration**: 3 Hrs

Class: X | Maths | **Total Marks** : 80

Instructions to the Students

- Write only question numbers clearly outside the margin (1, 2, 3.i, 5.b, 4.c.ii, etc.).
- Do not write questions or any titles. (For ex. - Do not write **II. Answer the following**).
- After every answer, give a one-line space.
- For Multiple choice Questions - Both Option and Answer should be written.
- Bullet points & Sub-points should be written inside the margin.
- Do not fold / staple the paper.

Section A

Multiple choice Questions : **(20 x 1 = 20)**

1. John is proving $2+\sqrt{3}$ is irrational.

He starts the solution as follows.

Step 1: Let us assume that, to the contrary, $2+\sqrt{3}$ is rational.

Which of the following could be step 2?

a) $2+\sqrt{3}=\frac{a}{b}$, where a and b integers and b ≠ 0

b) $2+\sqrt{3}=\frac{a}{b}$, where a and b whole numbers and b ≠ 0.

c) $2+\sqrt{3}=\frac{a}{b}$, where a and b coprimes and b ≠ 0

d) $2+\sqrt{3}=\frac{a}{b}$, where a and b natural numbers.

Answer

c) $2+\sqrt{3}=\frac{a}{b}$, where a and b coprimes and b ≠ 0 (1)

2. The coordinates of the point which divides the line joining (2, –2) and (6, -2) in the ratio 1:3 are:

a) (2.5,-2) b) (3.5,0) c) (2.5,-1) d) (3,-1)

Answer

d) (3,-1) (1)

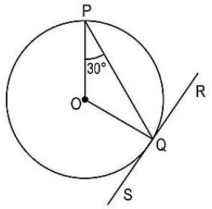
3. The graph of the pair of equations 2x – 3y = 5 and 3x – 2y = 8 intersect at:

a) (15,-1) b) (-14,1) c) $\left(\frac{14}{5}, \frac{1}{5}\right)$ d) $\left(\frac{-14}{5}, \frac{-1}{5}\right)$

Answer

c) $\left(\frac{14}{5}, \frac{1}{5}\right)$ (1)

4. In the figure below, O is the centre of the circle, RS is a tangent to the circle at Q.



(Note: The figure is not to scale.)

Which of the following gives the measure of ∠PQR?

a) 30° b) 45° c) 60° d) 90°

Answer

c) 60° (1)

5. If cosec A = $\frac{13}{12}$, then the value of $\frac{2\sin A-3\cos A}{4\sin A-9\cos A}$

a) 4 b) 5 c) 6 d) 3

Answer

d) 3 (1)

6. The quadratic equation $x^2 - 4x - 3\sqrt{2} = 0$ has

a) Two distinct real roots
b) Two equal real roots
c) No real roots
d) More than 2 real roots

Answer

a) Two distinct real roots

(1)

7. In a circle of radius 14 cm, an arc subtends an angle of 45° at the centre, then the area of the sector is

a) 71 cm²
b) 76 cm²
c) 77 cm²
d) 154 cm²

Answer

c) 77 cm²

(1)

8. A box contains cards numbered 9 to 53. A card is drawn at random from the box. The probability that the drawn card has a number which is a perfect square is :

a) $\frac{1}{45}$
b) $\frac{2}{15}$
c) $\frac{4}{45}$
d) $\frac{1}{9}$

Answer

d) $\frac{1}{9}$

(1)

9. If sin (A - B) = $\frac{1}{2}$, cos (A + B) = $\frac{1}{2}$ for 0<(*A*+*B*)≤90° and A>B, then A and B are

a) 60° , 30°
b) 60° , 15°
c) 45° , 15°
d) 60° , 25°

Answer

c) 45° , 15°

(1)

10. The largest number that will divide 445, 572 and 699 leaving remainders 4, 5 and 6 respectively is:

a) 63
b) 36
c) 34
d) 45

Answer

a) 63

(1)

11. A sphere and cube have equal surface area.The ratio of the volumes of the sphere to that of cube is

a) √π : √6
b) √π : √3
c) √6 : √π
d) √3 : √π

Answer

c) √6 : √π

(1)

12. Which of the following equations has no real roots?

a) $2x^2 + 3\sqrt{2}x + 2 = 0$
b) $3x^2 + x - \sqrt{5} = 0$
c) $x^2 - 4x - 8 = 0$
d) $x^2 - 3x + 6 = 0$

Answer

d) $x^2 - 3x + 6 = 0$

(1)

13. If the area of circle is numerically equal to twice its circumference, then the diameter of the circle is

a) 4 units
b) 6 units
c) 8 units
d) 12 units

Answer

c) 8 units

(1)

14. If Δ ABC ~ Δ DEF, AB = 6cm, DE = 9cm, EF=6cm and FD=12cm, then the perimeter of Δ ABC is

a) 28 cm
b) 28.5 cm
c) 18 cm
d) 23 cm

Answer

c) 18 cm

(1)

15. Find the probability of getting a sum 7 from two dice.

a) $\frac{1}{6}$
b) $\frac{1}{8}$
c) $\frac{1}{12}$
d) $\frac{1}{36}$

Answer

a) $\frac{1}{6}$

(1)

16. The distance between the points (acosθ+b sinθ, 0) and (0, asinθ-b cosθ) is

a) $a^2 + b^2$
b) $a^2 - b^2$
c) $\sqrt{a^2 + b^2}$
d) $\sqrt{a^2 - b^2}$

Answer

c) $\sqrt{a^2 + b^2}$

(1)

17. Consider the following frequency distribution

Class	0-5	6-11	12-17	18-23	24-29
Frequency	13	10	15	8	11

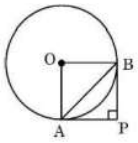
The upper limit of the median class is

a) 17 b) 17.5 c) 18 d) 18.5

Answer

a) 17 (1)

18. In the adjoining figure, PA and PB are tangents to a circle with centre O such that $\angle P = 90°$. If AB = $3\sqrt{2}$ cm, then the diameter of the circle is



a) $3\sqrt{2}\,cm$ b) $6\sqrt{2}\,cm$ c) 3cm d) 6cm

Answer

d) 6cm (1)

19. Assertion (A): sin (A + B) = sin A + sin B

Reason (R): For any value of θ, $1 + \tan^2\theta = \sec^2\theta$

a) Both assertion (A) and reason (R) are true and reason (R) is the correct explanation of assertion (A).
b) Both assertion (A) and reason (R) are true but reason (R) is not the correct explanation of assertion (A).
c) Assertion (A) is true but reason (R) is false.
d) Assertion (A) is false but reason (R) is true.

Answer

d) Assertion (A) is false but reason (R) is true. (1)

20. Assertion (A): If LCM of two numbers is 2475 and their product is 12375, then their HCF is 5

Reason (R): HCF (a, b) × LCM (a, b) = a × b.

a) Both (A) and (R) are true and (R) is the correct explanation of (A)
b) Both (A) and (R) are true but (R) is not the correct explanation of (A)
c) (A) is correct but (R) is wrong
d) (A) is wrong but (R) is correct

Answer

a) Both (A) and (R) are true and (R) is the correct explanation of (A) (1)

Section B

Very Short Answer Type Questions : **(5 x 2 = 10)**

21.a. If $\frac{4}{5}$, a , 2 are in AP, find the value of a.

Answer

1) $T_2 - T_1 = T_3 - T_2$ (0.5)

2) $a - \frac{4}{5} = 2 - a$ (0.5)

3) $5a - 4 = 10 - 5a$ (0.5)

4) $a = \frac{14}{10} = \frac{7}{5}$ (0.5)

(OR)

21.b. Find the sum of the following APs: $\frac{1}{15}, \frac{1}{12}, \frac{1}{10}$, ..., to 11 terms

Answer

1) a = $\frac{1}{15}, n = 11$, d = $\frac{1}{60}$ (0.5)

2) $S_{11} = \frac{11}{2}\left[2\left(\frac{1}{15} + (11-1)\frac{1}{60}\right)\right]$ (0.5)

3) $\frac{11}{2}\left(\frac{2}{15} + \frac{10}{60}\right)$ (0.5)

4) $\frac{33}{20}$ (0.5)

22. Evaluate : $\frac{cos45^0}{\sec 30^0} + \frac{1}{\sec 60^0}$

Answer

1) $\frac{\cos 45^\circ}{\sec 30^\circ} + \frac{1}{\sec 60^\circ} = \frac{\frac{1}{\sqrt{2}}}{\frac{2}{\sqrt{3}}} + \frac{1}{2}$ (0.5)

2) $= \frac{1}{\sqrt{2}} \times \frac{\sqrt{3}}{2} + \frac{1}{2}$ (0.5)

3) $= \frac{\sqrt{6}}{4} + \frac{1}{2}$ (0.5)

4) $= \frac{\sqrt{6}+2}{4}$ (0.5)

23. ABCD is a trapezium in which AB ∥ DC and its diagonals intersect each other at the point O. Show that $\frac{AO}{BO} = \frac{CO}{DO}$.

Answer

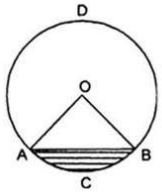
1) InΔBDC, $\frac{BO}{OD} = \frac{BE}{EC}$ ....(1) [by BPT] (0.5)

2) InΔABC, $\frac{AO}{OC} = \frac{BE}{EC}$ .....(2) [by BPT] (0.5)

3) From (1) and (2) , $\frac{AO}{OC} = \frac{BO}{OD}$ (0.5)

4) i.e. $\frac{AO}{BO} = \frac{CO}{DO}$ (0.5)

24.a. Find the area of the segment of a circle of radius 14 cm, if the length of the corresponding arc ACB is 22 cm and ∠AOB = 90°



Answer

1) $Areaofsegment = Areaofsection - Averof\Delta$ (0.5)

2) $= \frac{\theta}{360}\pi r^2 - \frac{1}{2} \times 14 \times 14$ (0.5)

3) $= \frac{90}{360} \times \frac{22}{7} \times 14^2 - \frac{1}{2}\left[14^2\right]$ (0.5)

4) 56cm2 (0.5)

(OR)

24.b. The length of the minute hand of a clock is 14 cm. Find the area swept by the minute hand in 5 minutes.

Answer

1) Angle swept by the minute hand in 1 minute = $(360^\circ \div 60) = 6^\circ$ (0.5)

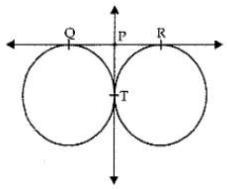
2) Angle swept by the minute hand in 5 minutes = $6^\circ \times 5 = 30^\circ$ (0.5)

3) $\therefore$ Area swept $= \frac{\theta}{360}\pi r^2 = \frac{30}{360} \times \frac{22}{7} \times 14 \times 14$ (0.5)

4) $= \frac{154}{3}$ (0.5)

5) Alternative response. (2)

25. In fig., QR is a common tangent to the given circles, touching externally at the point T. The tangent at T meet QR at P. If PT = 3.8 cm, find the length of QR.



Answer

1) $\therefore \mathrm{QP} = \mathrm{PT}$ and $\mathrm{PR} = PT$ (0.5)

2) $\mathrm{QP} = 3.8\,\mathrm{cm}$ and $\mathrm{PR} = 3.8\,\mathrm{cm}$ (0.5)

3) Now, $\mathrm{QR} = \mathrm{QP} + \mathrm{PR}$ (0.5)

4) Now, $\mathrm{QR} = = 7.6\,\mathrm{cm}$ (0.5)

Section C

Short Answer Type Questions : **(6 x 3 = 18)**

26. If a circle touches the side BC of a triangle ABC at P and the extended sides AB and AC at Q and R respectively, prove that $AQ = \frac{1}{2}(BC + CA + AB)$

Answer

1) Diagram (0.5)
2) BP = BQ..(1), CP = CR..(2),AQ = AR..(3) (0.5)
3) From (1) and (2),AB+BC+CA = AB + BQ + CR + AC (0.5)
4) AB + BQ = AQ ,CR + AC = AR ,BQ + CR = BC (0.5)
5) AB + BC + AC = AQ + AR (0.5)
6) From (3), $AQ = \frac{1}{2}(BC + CA + AB)$ (0.5)

27. A sweet shopkeeper prepares 396 gulab jamuns and 342 ras-gullas. He packs them into containers. Each container consists of either gulab jamun or ras-gullas but have equal number of pieces. Find the number of pieces he should put in each box so that number of boxes are least.

Answer

1) $396 = 2 \times 2 \times 3 \times 3 \times 11$ (0.5)

2) $342 = 2 \times 3 \times 3 \times 19$ (0.5)

3) $HCF = 18$ (1)

4) $No.\ of\ boxes\ of\ Gulab\ jamun = 22$ (0.5)

5) $No.\ of\ boxes\ of\ Rasgulas = 19$ (0.5)

28. Find the zeros of the polynomial $f(x) = 4\sqrt{3}x^2 + 5x - 2\sqrt{3}$, and verify the relation between zeros and its coefficients.

Answer

1) $4\sqrt{3}x^2 + 8x - 3x - 2\sqrt{3}$ (0.5)

2) $x = \frac{\sqrt{3}}{4}, -\frac{2}{\sqrt{3}}$ (0.5)

3) $\alpha + \beta = \frac{\sqrt{3}}{4} - \frac{2}{\sqrt{3}} = -\frac{5}{4\sqrt{3}}$ (0.5)

4) $\Rightarrow \alpha + \beta = -\frac{b}{a}$ (0.5)

5) $\alpha\beta = \frac{\sqrt{3}}{4}x - \frac{2}{\sqrt{3}} = \frac{-1}{2}$ (0.5)

6) $\alpha\beta = \frac{c}{a} = \frac{-1}{2}$ (0.5)

29.a. Prove that : $\frac{sin\theta + \cos\theta}{\sin\theta - \cos\theta} + \frac{sin\theta - \cos\theta}{sin\theta + \cos\theta} = \frac{2sec^2\theta}{tan^2\theta - 1}$

Answer

1) $\frac{\sin\theta + \cos\theta}{\sin\theta - \cos\theta} + \frac{\sin\theta - \cos\theta}{\sin\theta + \cos\theta} = \frac{(\sin\theta + \cos\theta)^2 + (\sin\theta - \cos\theta)^2}{(\sin\theta - \cos\theta)(\sin\theta + \cos\theta)}$ (0.5)

2) $\frac{\sin^2\theta + \cos^2\theta + 2\sin\theta \cdot \cos\theta + \sin^2\theta + \cos^2\theta - 2\sin\theta \cdot \cos\theta}{\sin^2\theta - \cos^2\theta}$ (0.5)

3) $\frac{\sin^2\theta + \cos^2\theta + \sin^2\theta + \cos^2\theta}{\sin^2\theta - \cos^2\theta}$ (0.5)

4) $\frac{2}{\sin^2\theta - \cos^2\theta}$ (0.5)

5) $\frac{\frac{2}{\cos^2\theta}}{\frac{\sin^2\theta}{\cos^2\theta} - \frac{\cos^2\theta}{\cos^2\theta}}$ (0.5)

6) $\frac{2\sec^2\theta}{\tan^2\theta - 1}$ (0.5)

7) Another method (3)

(OR)

29.b. Prove that $\frac{\tan\ \theta}{1 - \cot\ \theta} + \frac{\cot\ \theta}{1 - \tan\ \theta} = 1 + \sec\ \theta\ \text{cosec}\ \theta$

Answer

1) $= \frac{\frac{\sin\theta}{\cos\theta}}{1 - \frac{\cos\theta}{\sin\theta}} + \frac{\frac{\cos\theta}{\sin\theta}}{1 - \frac{\sin\theta}{\cos\theta}}$ (1)

2) $\frac{(\sin^3\theta - \cos^3\theta)}{(cos\theta sin\theta(sin\theta - cos\theta))}$ (1)

3) $1 + \left(\frac{1}{\cos\theta}\right)\ \left(\frac{1}{\sin\theta}\right) = 1 + \sec\theta\ \cos ec\ \theta$ (1)

30. A card is drawn at random from a standard deck of 52 playing cards.
Find the probability that the card drawn is:
i) a queen.
ii) a spade.
iii) a queen of spades.

Answer

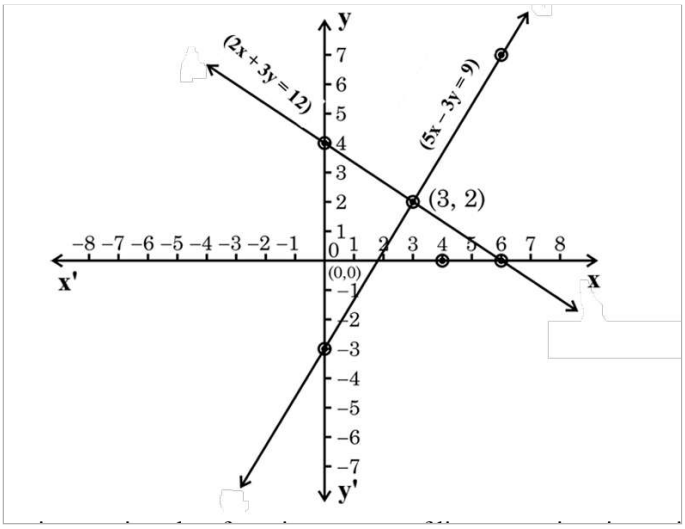
1) The probability of getting a queen in the drawn card as = $\frac{4}{52}\ or\ \frac{1}{13}$ (1)

2) The probability of getting a spade in the drawn card as = $\frac{13}{52}\ or\ \frac{1}{4}$ (1)

3) The probability of getting a queen of spades as = $\frac{1}{52}$ (1)

31.a. Check graphically whether the pair of linear equations 2x + 3y = 12; 5x – 3y = 9 is consistent. If so, solve it graphically.

Answer



Graph (2)

As lines are intersecting, therefore given system of linear equations is consistent. (0.5)

x=3,y=2 (0.5)

(OR)

31.b. Determine the values of m and n so that the following system of linear equation have infinite number of solutions :

(2m-1)x+3y-5=0

3x+(n-1)y-2=0

Answer

1) $a_1x + b_1y + c_1 = 0$ (0.5)

2) $a_2x + b_2y + c_2 = 0$ (0.5)

3) $\frac{a_1}{a_2} = \frac{b_1}{b_2} = \frac{c_1}{c_2}$ (0.5)

4) $\frac{2m-1}{3} = \frac{3}{n-1} = \frac{-5}{-2}$ (0.5)

5) $\Rightarrow 4m - 2 = 15$ and $6 = 5n - 5$ (0.5)

6) $m = \frac{17}{4}$ and $n = \frac{11}{5}$ (0.5)

Section D

Long Answer Type Questions : **(4 x 5 = 20)**

32. Find x interms of a,b and c : $\frac{a}{x-a} + \frac{b}{x-b} = \frac{2c}{x-c}$, x ≠ a ,b , c.

Answer

1) $a(x-b)(x-c) + b(x-a)(x-c) = 2c(x-a)(x-b)$ (1)

2) $ax^2 - abx - acx + abc + bx^2 - bax - bcx + abc = 2cx^2 - 2cxb - 2cxa + 2abc$ (0.5)

3) $ax^2 + bx^2 - 2cx^2 - abx - acx - bax - bcx + 2cbx + 2acx = 0$ (0.5)

4) $x^2(a + b - 2c) - 2abx + acx + bcx = 0$ (1)

5) $x^2(a + b - 2c) + x(-2ab + ac + bc) = 0$ (1)

6) $X = -\left(\frac{ac+bc-2ab}{a+b-2c}\right)$ (1)

33. State and prove Basic proportionality theorem.

Answer

1) $\frac{ar(ADE)}{ar(BDE)} = \frac{\frac{1}{2}\times AD\times EF}{\frac{1}{2}\times DB\times EF}$ (1)

2) $\frac{ar(ADE)}{ar(DEC)} = \frac{\frac{1}{2}\times AE\times DG}{\frac{1}{2}\times EC\times DG}$ (1)

3) $\frac{ar(ADE)}{ar(DEC)} = \frac{AE}{EC}$ (1)

4) $According\ to\ the\ property\ of\ triangles, the\ triangles\ drawn\ between\ the\ same\ parallel\ lines\ and\ on\ the\ same$ (1)

5) $Therefore, we\ can\ say\ that\ \Delta DBE and\ DEC\ have\ the\ same area$ (0.5)

6) $area\ of\ \Delta DBE = area\ of\ \Delta DEC \ldots\ldots\ldots\ldots (C)$ (0.5)

34.a. The internal and external diameters of a hollow hemispherical vessel are 16 cm and 12 cm respectively. If the cost of painting 1 cm^2 of the surface area is Rs. 5.00, find the total cost of painting the vessel all over. (Use π=3. 14)

Answer

1) $Here\ R = 8\ \text{cm}, r = 6\ cm$ (0.5)

2) $Surface\ area = 2\pi R^2 + 2\pi r^2 + \pi\left(R^2 - r^2\right)$ (1)

3) $= \pi\left[2\times 8^2 + 2\times 6^2 + \left(8^2 - 6^2\right)\right]$ (0.5)

4) $= \pi[2\times 64 + 2\times 36 + (64 - 36)]$ (0.5)

5) $= \pi[128 + 72 + 28]$ (0.5)

6) $= 228\times 3.14$ (0.5)

7) $= 715.92\ \text{cm}^2$ (0.5)

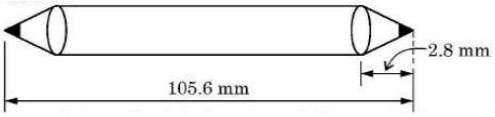
8) $Totalcost = 715.92\times 5$ (0.5)

9) $Totalcost = 3579.60\text{Rs}$ (0.5)

10) Any Valid Response (5)

(OR)

34.b. On the day of her examination, Riya sharpened her pencil from both ends as shown below:



The diameter of the cylindrical and conical part of the pencil is 4.2 mm. If the height of each conical part is 2.8 mm and length of entire pencil is 105.6 mm, find the total surface area of the pencil.

Answer

1) $\text{r} = 2.1\ \text{mm}$ (0.5)

2) $Height\ of\ cylindrical\ part(\text{h}) = 100\ \text{mm}$ (0.5)

3) $Slant\ height(l) = \sqrt{(2.8)^2 + (2.1)^2} = 3.5\,\text{mm}$ (1)

4) $Curved\ Surface\ Area\ of\ Cylinder\ (2\pi rh) = 2\times\frac{22}{7}\times 2.1\times 100 = 1320\ \text{mm}^2$ (1)

5) $Curved\ Surface\ Area\ of\ Cone\ (\pi rl) = \frac{22}{7}\times 2.1\times 3.5 = 23.1\ \text{mm}^2$ (1)

6) $Total\ Surface\ Area\ of\ pencil = Curved\ Surfac\ e\ Area\ of\ cylinder + Curved\ Surface\ Area\ of\ two\ cones = 1366.2\ \text{mm}$ (1)

35.a. The median of the following data is 525. Find the values of x and y , if total frequency is 100 :

Class	Frequency
0-100	2
100-200	5
200-300	x
300-400	12
400-500	17
500-600	20
600-700	y
700-800	9
800-900	7
900-1000	4

Answer

Class Interval	Frequency (f)	Cum. freq. $c.f.$
0-100	2	2
100-200	5	7
200-300	x	$7+x$
300-400	12	$19+x$
400-500	17	$36+x$
500-600	20	$56+x$
600-700	y	$56+x+y$
700-800	9	$65+x+y$
800-900	7	$72+x+y$
900-1000	4	$76+x+y$
	$N=100$	

From table we have

$$76+x+y=100$$

$$x+y=100-76=24 \quad \ldots(1)$$

Here median is 525 which lies between class $500-600$. Thus median class is 500-600.

Median, $M_l = l+\left(\frac{\frac{N}{2}-F}{f}\right)h$

$$525 = 500+\left[\frac{\frac{100}{2}-(36+x)}{20}\right]\times 100$$

$$25 = (50-36-x)5$$

$$14-x=\frac{25}{5}=5$$

$$x=14-5=9$$

Substituting the value of x is equation (1), we get

$$y=24-9=15$$

Hence, $x=9$ and $y=15$

Table	(1.5)
x+y=100-76=24	(0.5)
Median= l+((N/2 -f)f)xh	(0.5)
25=(50-36-x)5	(0.5)
x=9	(1)
y=15	(1)

(OR)

35.b. Literacy rates of 40 cities are given in the following table. It is given that mean literacy rate is 63.5, then find the missing frequencies x and y.

Literacy rate (in %)	35-40	40-45	45-50	50-55	55-60	60-65	65-70	70-75	75-80	80-85	85-90
Number of cities	1	2	3	x	y	6	8	4	2	3	2

Answer

C.I.	x_i	u_i	f_i	f_iu_i
35 – 40	37.5	– 5	1	– 5
40 – 45	42.5	– 4	2	– 8
45 – 50	47.5	– 3	3	– 9
50 – 55	52.5	– 2	x	$-2x$
55 – 60	57.5	– 1	y	$-y$
60 – 65	62.5 = A	0	6	0
65 – 70	67.5	1	8	8
70 – 75	72.5	2	4	8
75 – 80	77.5	3	2	6
80 – 85	82.5	4	3	12
85 – 90	87.5	5	2	10
Total			$\Sigma f_i = 31 + x + y$	$\Sigma f_iu_i = 22 - 2x - y$

Here, $\Sigma f_i = 31 + x + y = 40$

$\Rightarrow \quad x + y = 9$

$\Sigma f_iu_i = 22 - 2x - y$

$\therefore \quad \text{Mean} = A + \frac{\Sigma f_iu_i}{\Sigma f_i} \times h$

$\Rightarrow \quad 63.5 = 62.5 + \frac{(22 - 2x - y)}{40} \times 5$

$\Rightarrow \quad 2x + y = 14$

Solving eqns (i) and (ii), x = 5 and y = 4

table (2)

finding mean value (1.5)

and finding x and y values (1.5)

Section E

Case Based Questions : **(3 x 4 = 12)**

36. In a class the teacher asks every student to write an example of A.P. Two friends Geeta and Madhuri writes their progressions as -5, -2, 1,4, ... and 187, 184, 181, ... respectively. Now, the teacher asks various students of the class the following questions on these two progressions. Help students to find the answers of the questions.

36.i. Find the 34th term of the progression written by Madhuri. [1]

a) 286 b) 88 c) -99 d) 190

Answer

b) 88 (1)

36.ii. Find the 19th term of the progression written by Geeta. [1]

a) 49 b) 59 c) 52 d) 62

Answer

a) 49 (1)

36.iii.a. Find the sum of first 10 terms of the progression written by Geeta. [2]

a) 85 b) 95 c) 110 d) 200

Answer

a) 85 (2)

(OR)

36.iii.b. Which term of the two progressions will have the same value? [2]

a) 31 b) 33 c) 32 d) 30

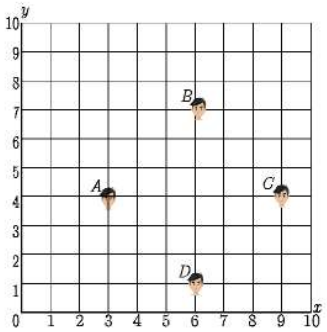
Answer

b) 33 (2)

37. Morning assembly is an integral part of the school's schedule. Almost all the schools conduct morning assemblies which include prayers, information of latest happenings, inspiring thoughts, speech, national anthem, etc. A good school is always particular about their morning assembly schedule. Morning assembly is important for a child's development. It is essential to understand

that morning assembly is not just about standing in long queues and singing prayers or national anthem, but it's something beyond just prayers. All the activities carried out in morning assembly by the school staff and students have a great influence in every point of life. The positive effects of attending school assemblies can be felt throughout life.

Have you noticed that in school assembly you always stand in row and column and this make a coordinate system. Suppose a school have 100 students and they all assemble in prayer in 10 rows as given below.



Here A ,B, C and D are four friend Amar, Bharat, Colin and Dravid.

37.i. What is the distance between A and B ? [1]

Answer

AB = $\sqrt{18}$ *or* $3\sqrt{2}$ (1)

37.ii. What is the distance between C and D ? [1]

Answer

CD = $\sqrt{18}$ *or* $3\sqrt{2}$ (1)

37.iii.a. What is the distance between A and C ? [2]

Answer

AC = $\sqrt{36}$ or 6 (2)

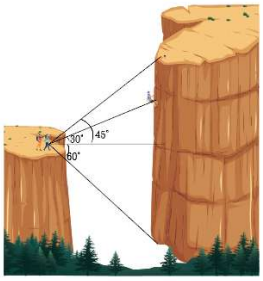
(OR)

37.iii.b. What is the distance between D and B ? [2]

Answer

BD = $\sqrt{36}$ or 6 (2)

38. Height of a Climber : Himalayan Trekking Club has just hiked to the south rim of a large canyon, when they spot a climber attempting to scale the taller northern face. Knowing the distance between the sheer walls of the northern and southern faces of the canyon is approximately 150 meter, they attempt to compute the distance remaining for the climbers to reach the top of the northern rim.



Using a homemade transit, they sight an angle of depression of 60^0 to the bottom of the north face, and angles of elevation of 30^0 and 45^0 to the climbers and top of the northern rim respectively.

38.i. How high is the southern rim of the canyon? [1]

Answer

Height of southern rim of the canyon = $EF = CD = 150\sqrt{3}$ (1)

38.ii. The angle formed by the line of sight with the horizontal when the point being viewed is above the horizontal level is called? [1]

Answer

Angle of elevation (1)

38.iii.a. How high is the northern rim? [2]

Answer

Height of the northern rim of the canyon $= AD = AC + CD = 150 + 150\sqrt{3} = 150\left(\sqrt{3} + 1\right) m$ (2)

(OR)

38.iii.b. How much farther until the climber reaches the top? [2]

Answer

1) AB = AC-BC= $150 - \frac{150}{\sqrt{3}} m$ (1)

2) $50\left(3 - \sqrt{3}\right) m$ (1)