SSC PUBLIC EXAMINATIONS 2024-25

MATHEMATICS (SCERT Modal paper II)

(ENGLISH VERSION)

Time: 3 Hours 15 Minutes **Max. Marks: 100**

Instructions:

1. In the duration of 3hours 15 minutes, 15 minutes of time is allotted to read the question paper.

2. All answers shall be written in the answer booklet only.

3. Question paper consists of 4 Sections and 33 questions.

4. Internal choice is available in section - IV only.

5. Answers shall be written neatly and legibly.

SECTION-I

12 x 1 = 12 M

Note: i) Answer all the questions in one word or phrase.

ii) Each question carries 1 mark.

1. Statement A: π is irrational.
Statement B: All non-terminating and non-repeating decimals are irrational.
(A) Both statement A and B are true **(B) Only statement A is true**
(C) Only statement B is true **(D) Both statements A and B are false**

Sol: (A) Both statement A and B are true

2. Match the following:
For a quadratic polynomial $6x^2-3-7x$

Group – A		Group - B
(a) Number of zeros	[ ]	(i) -1/2
(b) Sum of zeroes	[ ]	(ii) 2
(c) Product of zeroes	[ ]	(iii) 7/6

(A) a →iii, b→ii, c→i **(B) a→ ii, b→ iii, c→i** **(C) a→i, b →iii, c→ii** **(D) a→i, b→ii, c→ iii**

Sol: **B**

(a) Number of zeros=2

$$\text{(b)Sum of zeroes} = \frac{-b}{a} = \frac{-(-7)}{6} = \frac{7}{6}$$

$$\text{(c)Product of zeroes} = \frac{c}{a} = \frac{-3}{6}$$

3. Form a pair of linear equations for the given information:
6 apples and 5 mangoes together cost ₹270. Whereas 5 apples and 3 mangoes together cost ₹190.

Sol: $6x + 5y = 270 \; and \; 5x + 3y = 190$

4. The common difference of the AP 3,1,-1, -3 .... is

Sol: Common difference(d) $= a_2 - a_1 = 1 - 3 = -2$

5. If Δ ABC ~ Δ DEF, AB = 4 cm, DE = 6 cm, EF = 9 cm and FD = 12 cm, find the perimeter of Δ ABC

Sol: If Δ ABC ~ Δ DEF then $\frac{AB}{DE} = \frac{BC}{EF} = \frac{AC}{DF}$

$$\frac{4}{6} = \frac{BC}{9} = \frac{AC}{12}$$

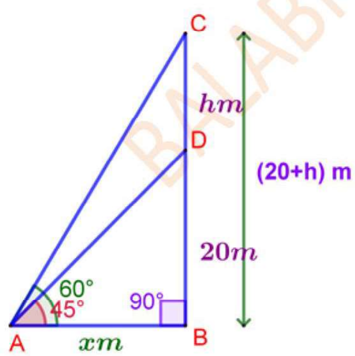
$$\frac{4}{6} = \frac{BC}{9} \Rightarrow BC = \frac{9 \times 4}{6} = 6$$

$$\frac{4}{6} = \frac{AC}{12} \Rightarrow AC = \frac{12 \times 4}{6} = 8$$

The perimeter of Δ ABC=AB+BC+AC=4+6+8=18 cm

6. Draw diagram for the information given "From a point on the ground, the angles elevation of the bottom and top of a tower fixed at the top of a 20m high building 45° and 60º respectively.

Sol:



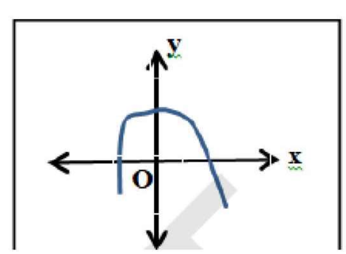
7. How many tangents can a circle have from an external point?

Sol: two (2)

8. Surface area of a top is the sum of curved surface areas of _____and_____

Sol: Hemisphere, cone

9. The sum of the probabilities of all elementary events of an experiment is



Sol: 1

10. The number of zeroes of the adjacent graph is

Sol: Two(2)

11. $\frac{2\tan 30°}{1+\tan^2 30^0}$

(A) Sin60° (B) Cos60° (C) tan60° (D) Sin30°

Sol: A

$$\frac{2\tan 30^0}{1+\tan^2 30^0} = \frac{2\times\frac{1}{\sqrt{3}}}{1+\left(\frac{1}{\sqrt{3}}\right)^2} = \frac{\frac{2}{\sqrt{3}}}{1+\frac{1}{3}} = \frac{\frac{2}{\sqrt{3}}}{\frac{4}{3}} = \frac{2\times 3}{4\times\sqrt{3}} = \frac{\sqrt{3}}{2} = \sin 60^0$$

12. If ½ is a root of the equation x^2+ kx-5/4=0 then the value of 'k' is

Sol: $\left(\frac{1}{2}\right)^2 + k\left(\frac{1}{2}\right) - \frac{5}{4} = 0$

$\frac{1}{4} + \frac{k}{2} - \frac{5}{4} = 0$

$\frac{k}{2} = \frac{5}{4} - \frac{1}{4} = \frac{4}{4} = 1$

$k = 2$

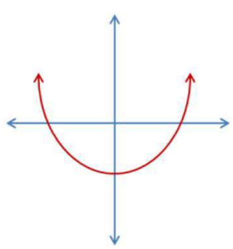
SECTION-II

13. Find the volume of the sphere whose radius is 7cm

Sol: Volume of the sphere $= \frac{4}{3}\pi r^3 = \frac{4}{3}\times\frac{22}{7}\times 7\times 7\times 7 = \frac{4312}{3} = 1437.3\ cm^3$

14. Draw a rough diagram for the quadratic polynomial $ax^2 + bx + c, (a \neq 0)$ when $a > 0$.

Sol:



15. Find the value of k for the quadratic equation $kx(x-2)+6=0$. So that it has two equal roots.

Sol: $kx^2 - 2kx + 6 = 0$

$a = k, b = -2k, c = 6$

If the Q.E has equal roots then $b^2 - 4ac = 0$

$(-2k)^2 - 4\times k\times 6 = 0$

$4k^2 - 24k = 0$

$4k(k-6)=0$

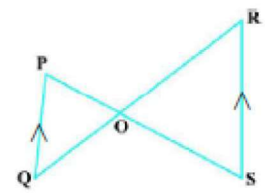
$4k=0 \ or \ k-6=0$

$k=0 \ or \ k=6$

$\therefore k=6 \ (if \ k=0 \ then \ a=0, b=0 \ it \ is \ not \ a \ Q.E)$

16. In Fig., if PQ || RS, prove that Δ POQ ~ Δ SOR.

Sol : PQ || RS (Given)



So, ∠ P = ∠ S (Alternate angles)

∠ Q = ∠ R (Alternate angles)

∠ POQ = ∠ SOR (Vertically opposite angles)

∴ Δ POQ ~ Δ SOR (AAA similarity criterion)

17. Find the point on the x-axis which is equidistant from the point (2,-5) and (-2,9)

Sol: Given points A(2, –5) and B(–2, 9).

Let $P(x, o)$ the point on the X-axis which is equidistant from A and B

A(2, –5), $P(x, o)$

$AP = \sqrt{(x_2-x_1)^2+(y_2-y_1)^2}$

$= \sqrt{(x-2)^2+(0+5)^2}$

$= \sqrt{x^2-4x+4+25}$

$= \sqrt{x^2-4x+29}$

B(–2, 9), $P(x, o)$

$BP = \sqrt{(x_2-x_1)^2+(y_2-y_1)^2}$

$= \sqrt{(x+2)^2+(0-9)^2}$

$= \sqrt{x^2+4x+4+81}$

$= \sqrt{x^2+4x+85}$

Now AP=BP⇒ $AP^2 = BP^2$

$x^2-4x+29 = x^2+4x+85$

$x^2-4x-x^2-4x = 85-29$

$-8x = 56 \Rightarrow x = \frac{56}{-8} = -7$

So, the required point is $(-7, 0)$.

18. If tan (A+B) = √3 and tan (A-B) = 1/√3, 0°< A + B< 90°, A>B. Find A and B

Sol: $\tan(A+B) = \sqrt{3} = \tan 60^0$

$A+B = 60^0 \rightarrow (1)$

$\tan(A - B) = \frac{1}{\sqrt{3}} = \tan 30^0$

$A - B = 30^0 \rightarrow (2)$

$(1) + (2) \Rightarrow A + B + A - B = 60^0 + 30^0$

$2A = 90^0 \Rightarrow A = 45^0$

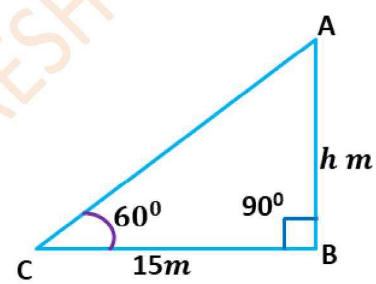
$From\ (1); 45^0 + B = 60^0 \Rightarrow B = 15^0$

19. A tower stands vertically on the ground. From a point on the ground which is 15m away from the foot of the tower, the angle of elevation of the top of the tower is found to be 60º. find the height of the tower.

Sol: Tower=AB=h m

The distance of the point from the tower=CB

The angle of elevation=$\angle$ACB=60^0



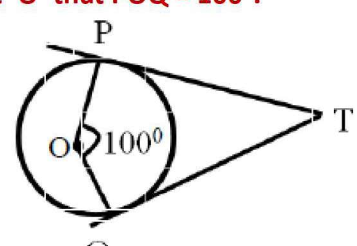
$\tan 60^0 = \frac{AB}{BC}$

$\sqrt{3} = \frac{h}{15}$

$h = 15\sqrt{3}$

$\therefore$ The height of the tower= $15\sqrt{3}\ m$

20. In the fig if TP and TQ are the two tangents to a circle with centre 'O' that POQ = 100°. Find the $\angle$PTQ



Sol: $\angle TPO = \angle TQO = 90^0 (Angle\ between\ radii\ and\ tangents)$

$\angle TPO + \angle TQO + \angle POQ + \angle PTQ = 360^0$(Sum of angles in quadrilateral)

$90^0 + 90^0 + 100^0 + \angle PTQ = 360^0$

$\angle PTQ = 360^0 - 280^0 = 80^0$

SECTION - III

Note: 1) Answer all the questions

2) Each question carries 4 marks

21. A piggy bank contains hundred 50p coins, fifty ₹1 coins, twenty ₹2 coins and ten ₹5coins. If it is equally likely that one of the coins will fall out when the bank is turned upside down, what is the probability that the coin (i) will be a 50p coin (ii) will not be a 5 coin?

Sol: Number of 50p coins=100

Number of ₹1 coins=50

Number of ₹2 coins=20

Number of ₹5coins=10

Total number of coins=100+50+20+10=180 , n(S)=180

(i) Number of favourable outcomes to 50 p coin=100

$$\text{P(50 p coin)} = \frac{100}{180} = \frac{5}{9}$$

(ii) Number of favourable outcomes to not be a ₹5 coin=180-10=170

$$\text{P(not be a ₹5 coin)} = \frac{170}{180} = \frac{17}{18}$$

22. Write formula to find the Median of grouped data and explain its terms.

Sol: $\text{Median} = l + \left(\frac{\frac{n}{2} - cf}{f}\right) \times h$

$where\ l$ = lower limit of median class,

n = number of observations,

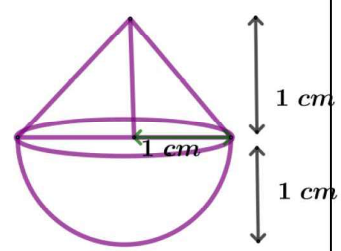
cf = cumulative frequency of class preceding the median class,

f = frequency of median class,

h = class size (size of the median class).

23. A solid is in the shape of a cone standing on a hemisphere with both their radii being equal to 1cm and the height of the cone is equal to its radius. Find the volume of the solid in terms of π

Sol: Cone: r=1 cm, h=1 cm



Hemisphere: r=1cm

Volume of the solid

= volume of the conical part + volume of the hemispherical part

$= \frac{1}{3}\pi r^2 h + \frac{2}{3}\pi r^3$

$= \frac{2}{3}\pi \times 1 \times 1 \times 1 + \frac{1}{3}\pi \times 1 \times 1 \times 1$

$= \frac{2\pi}{3} + \frac{\pi}{3}$

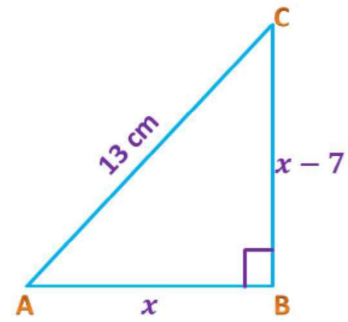
$= \frac{3\pi}{3} = \pi\ cm^3$

24. The altitude of a right triangle is 7 cm less than its base. If the hypotenuse is 13 cm, find the other two sides.

Sol: Base of a right triangle (AB)=x

The altitude (BC) $= x - 7$ cm

The hypotenuse (AC)$= 13$ cm



From Pythagoras theorem

$AB^2 + BC^2 = AC^2$

$x^2 + (x-7)^2 = 13^2$

$x^2 + x^2 - 14x + 49 - 169 = 0$

$2x^2 - 14x - 120 = 0$

$x^2 - 7x - 60 = 0$

$x^2 - 12x + 5x - 60 = 0$

$x(x-12) + 5(x-12) = 0$

$(x-12)(x+5) = 0$

$x - 12 = 0 \quad or \quad x + 5 = 0$

$x = 12 \quad or \quad x = -5$

$\therefore x = 12$ (since side of a triangle is positive integer so $x \neq -5$)

The other two sides are 12 cm, $(12-7)\ cm$ $i.e$ 12 cm, 5 cm.

25. Prove that $(\text{Sin}A + \text{Cosec}A)^2 + (\text{Cos}A + \text{Sec}A)^2 = 7 + \tan^2 A + \text{Cot}^2 A$

Sol: $L.H.S = (sin\,A + cosec A)^2 + (cos\,A + sec\,A)^2$

$= sin^2 A + cosec^2 A + 2 \sin A . cosec\, A + cos^2 A + sec^2 A + 2.cos\,A.\sec A$

$= sin^2 A + cos^2 A + cosec^2 A + sec^2 A + 2 \sin A \times \frac{1}{\sin A} + 2cos\,A \times \frac{1}{\cos A}$

$= 1 + cot^2 A + 1 + tan^2 A + 1 + 2 + 2$

$= 7 + tan^2 A + cot^2 A$

$= R.H.S$

26. If the sum of the first 14 terms of an AP is 1050 and its first term is 10, find the 20^{th} term.

Sol: $a = 10, n = 14,$

$S_{14} = 1050$

$\frac{n}{2}[2a + (n-1)d] = 1050$

$\frac{14}{2}[2 \times 10 + (14-1)d] = 1050$

$7[20 + 13d] = 1050$

$$20 + 13d = \frac{1050}{7} = 150$$

$$13d = 150 - 20$$

$$13d = 130$$

$$d = 10$$

20^{th} term$=a + 19d$

$$= 10 + 19 \times 10$$

$$= 10 + 190$$

$$= 200$$

27. Prove that the length of the tangents drawn from an external point to a circle are equal

Sol: A circle with centre O , PQ and PR are two tangents to the circle from P.

now we prove that PQ=PR

Join OQ,OR and OP.

In ΔOQP *and* ΔORP

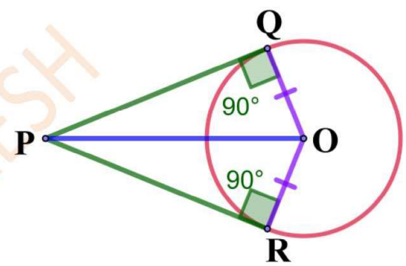
OQ=OR (Radii of the same circle)

OP = OP (Common)

$\angle OQP = \angle ORP = 90^0$ (Angle between radii and tangents)

Δ OQP $\cong$ Δ ORP(by RHS congruence rule)

PQ = PR (By CPCT)



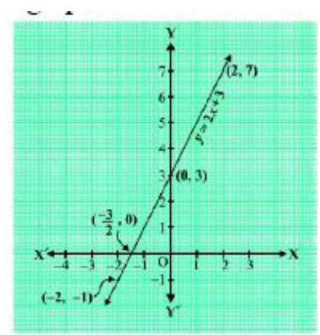
28. Observe the graph and answer the following questions

i) What is the shape of the graph?

ii) How many zeroes it has?

iii) What are the zeroes?

iv) How many times graph intersect x-axis



Sol: i) Straight line.

ii) One

iii) -3/2

iv) One

SECTION - IV

29. (a) Prove that √7 is irrational

Proof: Let us assume $\sqrt{7}$ is rational.

Then $\sqrt{7} = \frac{a}{b}$ $(a, b\ are\ coprimes)$

Squaring on both sides we get

$$7 = \frac{a^2}{b^2} \Rightarrow 7b^2 = a^2 \rightarrow (1)$$

p be a prime number .

If p dividesa^2 *then p divides a*

$\Rightarrow\ b^2 = \dfrac{a^2}{7}$

$\Rightarrow$ 7 divides a^2

$\Rightarrow$ 7 divides a

We can write $a = 7c$ $for\ some\ integer\ c$

$\Rightarrow a^2 = 49c^2$

$\Rightarrow\ 7b^2 = 49c^2$ (from (1))

$\Rightarrow\ b^2 = 7c^2$

$\Rightarrow\ c^2 = \dfrac{b^2}{7}$

$\Rightarrow$ 7 divides b^2

$\Rightarrow$ 7 divides b

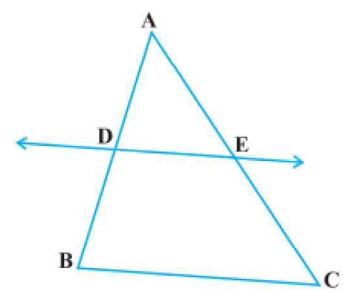
Therefore, both $a\ and\ b$ have 7 as a common factor.

But this contradicts the fact that $a\ and\ b$ are co-prime.

Thus our assumption is false.

So, we conclude that $\sqrt{7}$ is irrational.

(b) : If a line intersects sides AB and AC of a Δ ABC at D and E respectively and is parallel to BC, prove that $\dfrac{AD}{AB} = \dfrac{AE}{AC}$



Sol: In ΔABC, DE || BC

$$\frac{\text{AD}}{\text{DB}} = \frac{\text{AE}}{\text{EC}}\ (from\ basic\ proportionality\ theorem)$$

$$\Rightarrow \frac{DB}{AD} = \frac{EC}{AE}$$

$$\Rightarrow 1 + \frac{DB}{AD} = 1 + \frac{EC}{AE}$$

$$\Rightarrow \frac{AD + DB}{AD} = \frac{AE + EC}{AE}$$

$$\Rightarrow \frac{AB}{AD} = \frac{AC}{AE}$$

$$\Rightarrow \frac{AD}{AB} = \frac{AE}{AC}$$

30. (a) If the points A (6,1), B(8,2), C (9,4) and D (p.3) are the vertices of a parallelogram taken in order. Find the value of P.

Sol: We know that diagonals of parallelogram bisect each other.

Midpoint of AC= midpoint of BD.

$$Mipoint = \left(\frac{x_1 + x_2}{2}, \frac{y_1 + y_2}{2}\right)$$

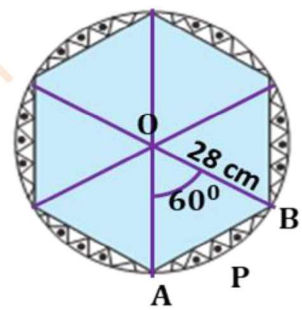
$$\left(\frac{6+9}{2}, \frac{1+4}{2}\right) = \left(\frac{8+p}{2}, \frac{2+3}{2}\right)$$

$$\left(\frac{15}{2}, \frac{5}{2}\right) = \left(\frac{8+p}{2}, \frac{5}{2}\right)$$

$$\Rightarrow 8 + P = 15$$

$$\Rightarrow p = 15 - 8 = 7$$

(b) A round table cover has six equal designs as shown in Fig. If the radius of the cover is 28 cm, find the cost of making the designs at the rate of ₹ 0.35 per cm². (Use $\sqrt{3} = 1.7$)



Sol: Radius(r)=28 cm

Angle of each sector (θ)=60⁰

Area of equilateral triangle OAB $= \frac{\sqrt{3}}{4} a^2$

$$Area\ of\ 6\ designs = Aea\ of\ the\ circle - 6 \times Area\ of\ the\ \triangle OAB$$

$$= \pi r^2 - 6 \times \frac{\sqrt{3}}{4} a^2$$

$$= \frac{22}{7} \times 28 \times 28 - \frac{3 \times 1.7}{2} \times 28 \times 28$$

$$= 28 \times 28 \times \left(\frac{22}{7} - \frac{5.1}{2}\right)$$

$$= \cancel{28}^{2} \times 28 \times \left(\frac{44 - 35.7}{\cancel{14}}\right)$$

$$= 2 \times 28 \times 8.3$$

$$= 464.8\ cm^2$$

The cost of making the designs per 1 cm²=₹ 0.35

Total cost of making design=₹ 0.35×464.8=₹162.68

31. (a) Two dice are thrown at the same time.
(i) Write all possible outcomes

(ii) What is the probability that sum of two numbers appearing on the top of the dice is (a) 6 (b)14

(iii) Find the probability of same number on both dice

Sol: When two dice are drawn at the same time then

(i) S={(1,1), (1,2),(1,3), (1,4), (1,5),(1,6),
(2,1), (2,2),(2,3), (2,4), (2,5),(2,6),
(3,1), (3,2),(3,3), (3,4), (3,5),(3,6),
(4,1), (4,2),(4,3), (4,4), (4,5),(4,6),
(5,1), (5,2),(5,3), (5,4), (5,5),(5,6),
(6,1), (6,2),(6,3), (6,4), (6,5),(6,6)}

n(S)=36

$$P(E) = \frac{\text{Number of outcomes favourable to E}}{\text{Number of all possible outcomes}} = \frac{n(E)}{n(S)}$$

(ii)(a) A= The event " getting the sum of two numbers appearing on the top of the dice is 6"

Favourable outcomes to A are (1,5),(2,4),(3,3),(4,2),(5,1)

n(A)=5

$$P(A) = \frac{5}{36}$$

(b) B= The event " getting the sum of two numbers appearing on the top of the dice is 14"

B is an impossible event.

$$P(B) = 0$$

(iii) C= The event " getting the same number on both dice"

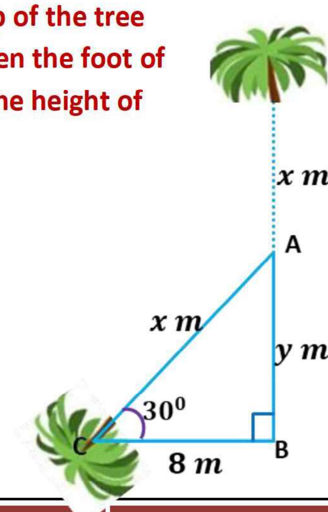
Favourable outcomes to C are (1,1),(2,2),(3,3),(4,4),(5,5),(6,6)

n(C)=6

$$P(C) = \frac{6}{36} = \frac{1}{6}$$

OR

(b) A tree breaks due to storm and the broken part bends. So that the top of the tree touches the ground making an angle 30° with it. The distance between the foot of the tree to the point where the top touches the ground is 8m. Find the height of the tree before it fell down.



Solution: Let length of remaining part =AB=$y\ m$

Length of broken part=AC=$x\ m$

BC=6m

Angle of elevation=$\angle ACB = 30^0$

From △ABC

$\cos 30^0 = \frac{BC}{AC}$

$\frac{\sqrt{3}}{2} = \frac{8}{x}$

$x \times \sqrt{3} = 8 \times 2$

$x = \frac{16}{\sqrt{3}}$

$\tan 30^0 = \frac{AB}{AC}$

$\frac{1}{\sqrt{3}} = \frac{y}{8}$

$y \times \sqrt{3} = 8 \times 1$

$y = \frac{8}{\sqrt{3}}$

$x + y = \frac{16}{\sqrt{3}} + \frac{8}{\sqrt{3}}$

$= \frac{24}{\sqrt{3}} \times \frac{\sqrt{3}}{\sqrt{3}}$

$= \frac{24\sqrt{3}}{3}$

$= 8\sqrt{3}$

The height of the tree before falling down$=8\sqrt{3}\,m$

32. (a) The table below shows the daily expenditure on food of 25 households in a locality. Find the mean daily expenditure on food by step deviation method.

Daily expenditure (in ₹)	100-150	150-200	200-250	250-300	300-350
Number of households	4	5	12	2	2

Sol:

Class intervals	Frequency (f_i)	Class mark (x_i)	$u_i = \frac{x_i - a}{h}$	$f_i u_i$
100-150	4	125	-2	-8
150-200	5	175	-1	-5
200-250	12	225→a	0	0
250-300	2	275	1	2
300-350	2	325	2	4
	$\sum f_i = 25$			$\sum f_i u_i = -7$

$a = 225,\ ,\ \sum f_i = 25, \sum f_i u_i = -7\ , h = 50$

$Mean(\bar{x}) = a + \left(\frac{\sum f_i u_i}{\sum f_i}\right) \times h$

$= 225 + \left(\frac{-7}{\cancel{25}}\right) \times \cancel{50}^2$

$= 225 + (-7) \times 2$

$= 225 - 14$

$= 211$

The mean daily expenditure on food=₹211

(b) **If the sum of first 'n' terms of an AP is 4n-n² (i) what is the first term? (ii) What is the sum of first two terms? (iii) What is the second term? (iv) Find the 3rd, 10th and nth terms.**

Sol: $In\ an\ AP : S_n = 4n - n^2$

$S_1 = 4 \times 1 - 1^2 = 4 - 1 = 3$

$S_2 = 4 \times 2 - 2^2 = 8 - 4 = 4$

$S_3 = 4 \times 3 - 3^2 = 12 - 9 = 3$

$S_4 = 4 \times 4 - 4^2 = 16 - 16 = 0$

$(i) First\ term = a_1 = S_1 = 3$

(ii)Sum of first two terms $= S_2 = 4 \times 2 - 2^2 = 8 - 4 = 4$

(iii)The second term $= a_2 = S_2 - S_1 = 4 - 3 = 1$

(iv) a = 3 and d $= a_2 - a_1 = 1 - 3 = -2$

$a_3 = a + 2d = 3 + 2 \times (-2) = 3 - 4 = -1$

$a_{10} = a + 9d = 3 + 9 \times (-2) = 3 - 18 = -15$

$a_n = a + (n-1)d = 3 + (n-1) \times (-2) = 3 - 2n + 2 = 5 - 2n$

33. (a) Check graphically whether the pair of equations 2x+ y -5=0 and 3x-2y -4=0 is consistent. If so, solve them graphically.

Sol: $2x + y - 5 = 0 \quad (a_1 = 2,\ b_1 = 1,\ c_1 = -5)$

$3x - 2y - 4 = 0 \quad (a_2 = 3, \quad b_2 = -2, \quad c_2 = -4)$

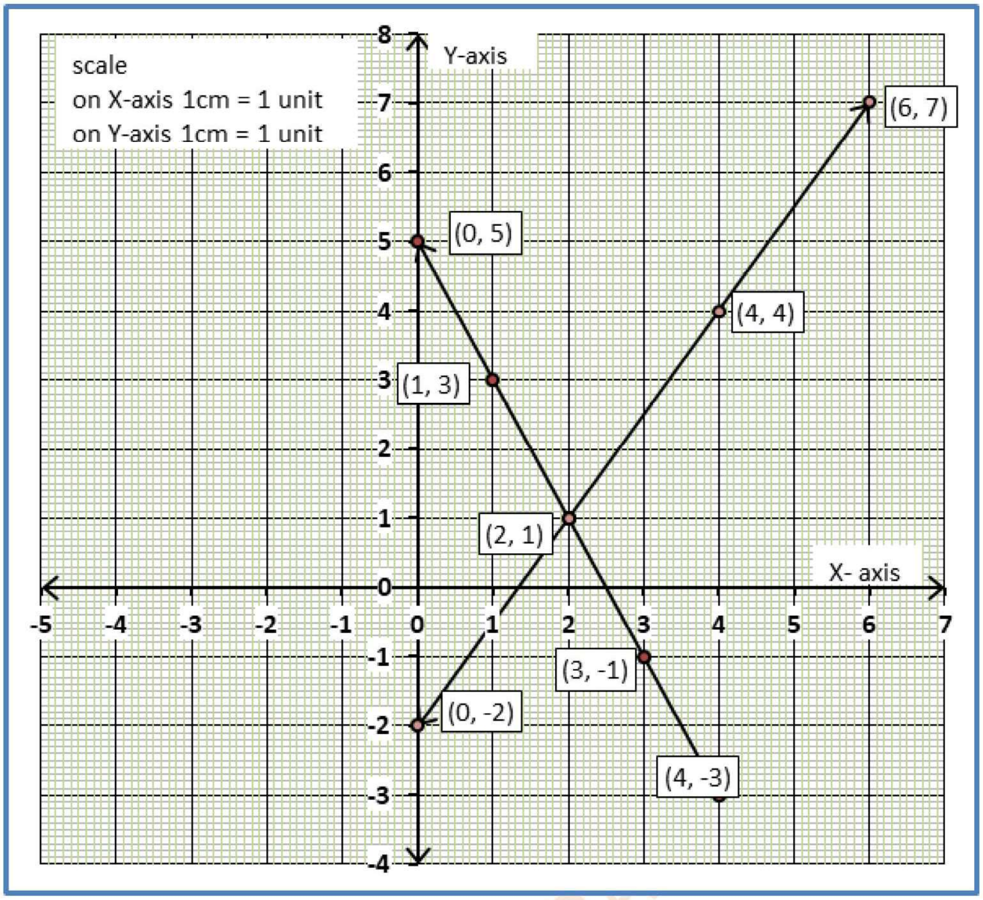
$\frac{a_1}{a_2} = \frac{2}{3};\ \frac{b_1}{b_2} = \frac{1}{-2};\ \frac{c_1}{c} = \frac{-5}{-4} = \frac{5}{4}$

$\frac{a_1}{a_2} \neq \frac{b_1}{b_2}$

$\therefore$ Given pair of equations represent intersecting lines and hence, consistent pair of linear equations.

$2x + y - 5 = 0 \Rightarrow y = 5 - 2x$		
x	$y = 5 - 2x$	(x, y)
0	$y = 5 - 2(0) = 5 - 0 = 5$	(0,5)
1	$y = 5 - 2(1) = 5 - 2 = 3$	(1,3)
3	$y = 5 - 2(3) = 5 - 6 = -1$	(3,−1)
4	$y = 5 - 2(4) = 5 - 8 = -3$	(4,−3)

$3x - 2y - 4 = 0 \Rightarrow 2y = 3x - 4 \Rightarrow y = \frac{3x-4}{2}$		
x	$y = \frac{3x-4}{2}$	(x, y)
0	$y = \frac{3(0)-4}{2} = \frac{0-4}{2} = \frac{-4}{2} = -2$	(0,−2)
2	$y = \frac{3(2)-4}{2} = \frac{6-4}{2} = \frac{2}{2} = 1$	(2,1)
4	$y = \frac{3(4)-4}{2} = \frac{12-4}{2} = \frac{8}{2} = 4$	(4,4)
6	$y = \frac{3(6)-4}{2} = \frac{18-4}{2} = \frac{14}{2} = 7$	(6,7)



The unique solution of this pair of equations is (2,1).

(b) Form a pair of linear equations and find the solution by graphical method. Meena went to a bank to withdraw ₹2000. She asked the cashier to give her ₹50 and ₹100 notes only. Meena got 25 notes in all. Find how many notes of ₹50 and ₹100 she received.

Sol: Let the number of ₹50 notes $= x$

The number of ₹100 notes $= y$

Total notes=25

$x + y = 25 \rightarrow (1)$

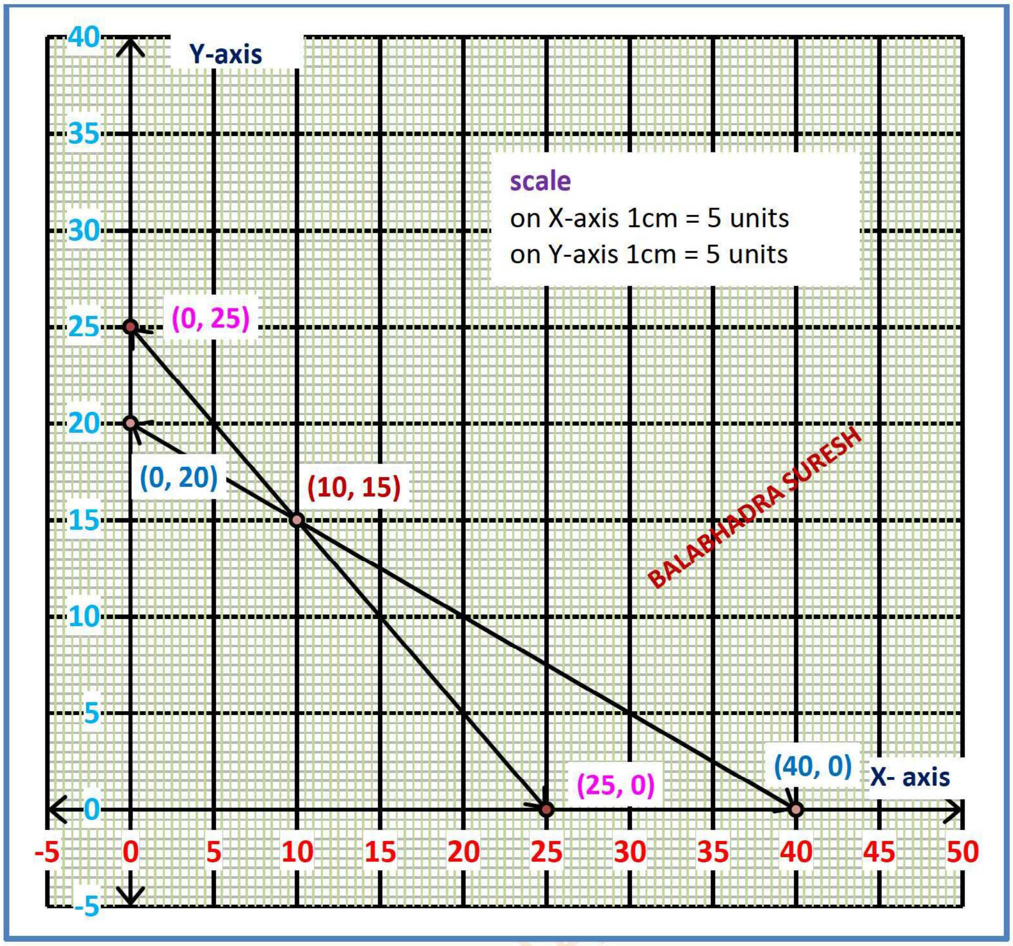
Value of notes=₹ 2000

$50x + 100y = 2000$

$x + 2y = 40 \rightarrow (2)$

$Equ(1)$	$x + y = 25$	(x, y)
$x = 0$	$0 + y = 25$ $y = 25$	(0,25)
$y = 0$	$x + 0 = 25$ $x = 25$	(25,0)

$Equ(2)$	$x + 2y = 40$	(x, y)
$x = 0$	$0 + 2y = 40$ $2y = 40$ $y = 20$	(0,20)
$y = 0$	$x + 2 \times 0 = 40$ $x + 0 = 40$ $x = 40$	(40,0)



The two lines intersect at the point (10, 15)
$x = 10 \text{ and } y = 15$

$\therefore$ Meena received ten ₹50 notes and fifteen ₹100 rupee notes.