THE VILLAGE INTERNATIONAL SCHOOL
"We Nurture Dreams"
AIM HIGH, TOGETHER WE FLY

DATE: 27/09/2024	FIRST TERMINAL EXAMINATION (2024 - 25)	TIME: 3 Hrs
GRADE: X	MARKING SCHEME MATHEMATICS (041)	MAX MARKS: 80

GENERAL INSTRUCTIONS:

1. **THIS QUESTION PAPER HAS 5 SECTIONS A, B, C, D, E**
2. **SECTION A HAS 20 MCQS CARRYING 1 MARK EACH**
3. **SECTION B HAS 5 QUSTIONS CARRYING 2 MARKS EACH**
4. **SECTION C HAS 6 QUESTIONS CARRYING 3 MARKS EACH**
5. **SECTION D HAS 4 QUESTIONS CARRYING 5 MARKS EACH**
6. **SECTION E HAS 3 CASE BASED INTERGRATED UNITS OF ASSESSMENT (4 MARKS EACH) WITH SUBPARTS OF THE VALUES OF 1, 1 AND 2 MARKS EACH RESPECTIVELY.**
7. **ALL QUESTIONS ARE COMPULSORY. HOWEVER, AN INTERNAL CHOICE IN 2 QUESTIONS OF 5 MARKS, 2 QUESTIONS OF 3 MARKS AND 2 QUESTIONS OF 2 MARKS HAS BEEN PROVIDED. AN INTERNAL CHOICE HAS BEEN PROVIDED IN THE 2 MARKS QUESTIONS OF SECTION E**

SL. NO.	**SECTION A**	MARKS
	SECTION A CONSISTS OF 20 QUESTIONS OF 1 MARK EACH	
1.	a. 2	1
2.	d. - 4	1
3.	b. ab = 6	1
4.	d. 15	1
5.	c. 7	1
6.	a. (2, 0)	1
7.	c. $\frac{1}{2}$	1
8.	c. $\frac{\sqrt{b^2 - a^2}}{b}$	1
9.	c. 9	1
10.	b. 0.21	1
11.	a. $\frac{1}{3}$	1

12.	a. is k = 3	1
13.	d. 0	1
14.	a. 1:2	1
15.	a. 2 distinct real roots	1
16.	d. c and a have same signs	1
17.	d. $180a^3b^4$	1
18.	d. 150	1
19.	d. A is false but R is true	1
20.	b. Both A and R are true and R is not the correct explanation of A	1
	SECTION B	
	SECTION B CONSISTS OF 5 QUESTIONS OF 2 MARKS EACH	
21.	If α and β are the zeroes of the polynomial $4x^2 - x - 4$, find the quadratic polynomial whose zeroes are $\frac{1}{2\alpha}$ and $\frac{1}{2\beta}$ $p(x) = 4x^2 - x - 4$ a = 4 , b = -1 , c = -4 α and β are zeros of p(x) we know that , sum of zeros = -b/a that is , α + β = -b/a = 1/4 product of zeros = c/a that is , αβ = -4/4 = -1 ========================== 1/2α and 1/2β are zeros of a polynomial sum of zeros = 1/2α + 1/2β = 2α + 2β / 4αβ = 2 [α + β] / 4αβ = [2 × 1/4] / 4× - 1 = (1/2)/ -4 = -1/8 product of zeros =(1/2α)(1/2β) = 1/4αβ = 1/4×-1	2

	= -1/4 a quadratic polynomial is given by , k {x^2 - [sum of zeros]x + [product of zeros]} k{x^2 - [-1/8]x - 1/4} k{x^2 + 1/8x - 1/4} putting k = 8 8(x^2 + 1/8x - 1/4) 8x^2 + x - 2 ----> is the required polynomial	
22.	Prove that √5 is an irrational number. Let √5 be a rational number. then it must be in form of p/q where, q≠0 (p and q are co-prime) √5=pq √5×q=p Squaring on both sides, $5q^2=p^2$ --------------(1) P^2 is divisible by 5. So, p is divisible by 5. p=5c Squaring on both sides, $P^2=25c^2$ --------------(2) Put p^2 in eqn.(1) $5q^2$ =$25(c)^2$ $q^2=5c^2$ So, q is divisible by 5. . Thus p and q have a common factor of 5. So, there is a contradiction as per our assumption.	2

	We have assumed p and q are co-prime but here they a common factor of 5. The above statement contradicts our assumption. Therefore, √5 is an irrational number.	
23.	Solve the following pair of linear equations in two variables. 7x – 2y = 5 and 8x + 7y = 15 Also state the nature of its graph. Here the given system of equations are 7x - 2y = 5 - - - - - - - - (1) 8x + 7y = 15 - - - - - - - (2) From Equation 1 we get $7x = 5 + 2y$ $\implies x = \frac{5+2y}{7}$ Substituting the value of x in Equation 2 we get $8\left(\frac{5+2y}{7}\right) + 7y = 15$ $\implies \frac{8(5+2y)+49y}{7} = 15$ $\implies \frac{40+16y+49y}{7} = 15$ $\implies \frac{40+65y}{7} = 15$ $\implies 40 + 65y = 105$ $\implies 65y = 65$ $\implies y = 1$ Putting y = 1 in Equation 1 we get $7x - (2 \times 1) = 5$ $\implies 7x - 2 = 5$ $\implies 7x = 7$ $\implies x = 1$ Hence the required solution is x = 1 , y = 1 It has a unique solution and the graphs intersects at one point	2
24.	If $4\cot^2 45 - \sec^2 60 + \sin^2 60 + p = \frac{3}{4}$, find the value of p $4cot^2(45°) - sec^2(60°) + sin^2(60°) + p = \frac{3}{4}$ $4 \times 1^2 - 2^2 + (\frac{\sqrt{3}}{2})^2 + p = \frac{3}{4}$ $4 - 4 + \frac{3}{4} + p = \frac{3}{4}$ $p = \frac{3}{4} - \frac{3}{4}$ $p = 0$	2

	Or Prove that $\frac{(\sin A)^2}{1-\cos A} = \frac{1+\sec A}{Sec\ A}$ $LHS\ \frac{1+\sec A}{\sec A} = \frac{1+\frac{1}{\cos A}}{\frac{1}{\cos A}}$ $= \frac{\frac{\cos A + 1}{\cos A}}{\frac{1}{\cos A}}$ $= \frac{\cos A + 1}{\cos A} \times \frac{\cos A}{1}$ $= 1 + \cos A$ $= 1 + \cos A \times \frac{1-\cos A}{1-\cos A}$ $= \frac{(1)^2 - (\cos A)^2}{1-\cos A}$ $= \frac{1-\cos^2 A}{1-\cos A}$ $= \frac{\sin^2 A}{1-\cos A}$ $= RHS$	
25.	If the centre of a circle is (2a, a - 7), then find the values of a, if the circle passes through the point (11, -9) and has diameter 10√2 units. Let the given point $P(x_1, y_1) = (11, -9)$ lie on a circle with $C(x_2, y_2) = (2a, a-7)$ & radius = r. Then $PC = r \ldots\ldots (i)$ Given that the diameter of the circle = $10\sqrt{2}$units. $\therefore\ r = \frac{\text{diameter}}{2} = \frac{10\sqrt{2}\text{units}}{2} = 5\sqrt{2}\text{units} \ldots (ii).$	2

Again, by distance formula, $d = \sqrt{(x_1 - x_2)^2 + (y_1 - y_2)^2}$

$\therefore$ $PC = d = \sqrt{(11 - 2a)^2 + (-9 - a + 7)^2} = \sqrt{5a^2 - 40a + 125}$.

$\therefore$ From (i) & (ii) we get

$5a^2 - 40a + 125 = (5\sqrt{2})^2$

$\Rightarrow 5a^2 - 40a + 75 = 0$

$\Rightarrow (a - 5)(5a - 3) = 0$

$\Rightarrow a = 5, \frac{3}{5}$

Ans $a = 5, \frac{3}{5}$

Or

If the point P(x, y) is equidistant from the points A(a+b, b - a) and B(a – b, a + b). Prove that bx = ay

Let P(x,y), Q(a+b,b-a) and R(a-b,a+b) be the given points. Then,PQ=PR

$\Rightarrow \sqrt{\{x - (a + b)\}^2 + \{y - (b - a)\}^2} = \sqrt{\{x - (a - b)\}^2 + \{y - (a + b)\}^2}$

$\Rightarrow \{x - (a + b)\}^2 + \{y - (b - a)\}^2 = \{x - (a - b)\}^2 + \{y - (a + b)\}^2$

$\Rightarrow x^2 - 2x(a + b) + (a + b)^2 + y^2 - 2y(b - a) + (b - a)^2$

$= x^2 + (a - b)^2 - 2x(a - b) + y^2 - 2y(a + b) + (a + b)^2$

$\Rightarrow -2x(a + b) - 2y(b - a) = -2x(a - b) - 2y(a + b)$

$\Rightarrow ax + bx + by - ay = ax - bx + ay + by$

$\Rightarrow 2bx = 2ay \Rightarrow bx = ay$

REMARK-We know that a point which is equidistant from point P and Q lies on the
perpendicular bisector of PQ. Therefore, bx=ay is the equation of the perpendicular
bisector of PQ

SECTION C

SECTION C CONSISTS OF 6 QUESTONS OF 3 MARKS EACH

26.	Rohan's mother is 26 years older than him. The product of their ages 3 years from now will be 360. Formulate the quadratic equation to find their ages and find the mother's present age.	3

	Let Rohan present age be x years. Then, his mother's age is (x + 26) years. Rohan's age after 3 years = (x + 3) years After 3 years the age of Rohan's mother= (x + 26 + 3)years= (x + 29) years It is given that after 3 years from now, the product of Rohan's and his mother's ages will be 360 years $\therefore (x+3)(x+29) = 360 \Rightarrow x^2 + 32x - 273 = 0$....answer This is the required equation. $\therefore (x+39)(x-7) = 0$ $\therefore x = -39$ and $x = 7$ $\therefore x = 7$.......($\because$ x can not be negative) $\therefore$ Mother's present age= 7 + 26 = 33....answer Or A motor boat, whose speed is 20 km/hr in still water takes 1 hour more to go 48 km upstream than to return downstream to the same spot. Find the speed of the stream. Let, the speed of the stream be x km/hr Speed of boat in still water = 20 km/hr $\therefore$Speed of boat with downstream 20 + x km/hr $\therefore$ Speed of boat with upstream 20 − x km/hr As per given condition $\frac{48}{20-x} - \frac{48}{20+x} = 1$ $\Rightarrow 48\left[\frac{1}{20-x} - \frac{1}{20+x}\right] = 1$ $\Rightarrow \left[\frac{20+x-20+x}{(20-x)(20+x)}\right] = \frac{1}{48}$ $\Rightarrow \frac{2x}{400-x^2} = \frac{1}{48}$ $\Rightarrow 96x = 400 - x^2$ $\Rightarrow x^2 + 96x - 400 = 0$ $\Rightarrow x^2 + 100x - 4x - 400$ $\Rightarrow x(x+100) - 4(x+100) = 0$ $\Rightarrow (x-4)(x+100) = 0$ Either, $x = 4$ or $x = -100$ $\because$ Speed cannot be negative $\therefore$ x = 4 km/hr is considered. $\therefore$ the speed of the stream = 4 km/hr	
27.	Find the ratio in which the y – axis divides the line segment joining the points (6, -4) and (-2, -7). Also find the point of intersection.	3

	Given two points $A(-2,-7)$ and $B(6,-4)$ Let $P(0,a)$ be a point on y-axis divides the line segment AB in the ratio $1:k$ Using section formula, x coordinates of P can be written as: $0=\frac{1(6)+k(-2)}{1+k}$ $-2k=-6$ $k=3$ y-axis divides the line AB in $1:3$ ratio Further, y coordinate of P can be expressed as, $a=\frac{1(-4)+k(-7)}{1+k}$ $a=\frac{-4+3(-7)}{1+3}$ $a=-\frac{25}{4}$ Point of intersection: $\left(0,-\frac{25}{4}\right)$	
28.	Prove that $\frac{Cos\ A-\sin A+1}{\cos A+\sin A-1}$ = cosec A + cot A, using the identity $cosec^2A = 1 + cot^2A$ L.H.S. $\frac{\cos A-\sin A+1}{\cos A+\sin A-1}$ On rationalize and we get, $\frac{\cos A-\sin A+1}{(\cos A+\sin A)-1}\times\frac{(\cos A+\sin A)+1}{(\cos A+\sin A)+1}$ $=\frac{\cos^2 A+\cos A\sin A+\cos A-\sin A\cos A-\sin^2 A-\sin A+\cos A+\sin A -}{(\cos A+\sin A)^2-1^2}$ $=\frac{\cos^2 A-\sin^2 A+2\cos A+1}{\cos^2 A+\sin^2 A+2\sin A\cos A-1}$ $=\frac{\cos^2 A+2\cos A+1-\sin^2 A}{1+2\sin A\cos A-1}$ $=\frac{2\cos^2 A+2\cos A}{2\sin A\cos A}$ $=\frac{2\cos A(\cos A+1)}{2\sin A\cos A}$ $=\frac{\cos A+1}{\sin A}$ $=\frac{\cos A}{\sin A}+\frac{1}{\sin A}$ $=\csc A+\cot A$ R.H.S.	3

Or

Prove that:

$$\frac{\sin\theta - 2\sin^3\theta}{2\cos^3\theta - \cos\theta} = \tan\theta$$

L.H.S.

$$= \frac{\sin\theta - 2\sin^3\theta}{2\cos^3\theta - \cos\theta}$$

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

We know that

$$\cos 2\theta = 1 - 2\sin^2\theta = 2\cos^2\theta - 1$$

Therefore,

$$= \frac{\sin\theta(\cos 2\theta)}{\cos\theta(\cos 2\theta)}$$

$$= \frac{\sin\theta}{\cos\theta}$$

$$= \tan\theta$$

R.H.S

Hence, proved.

29. A 1.5 m tall boy is standing at some distance from a 30 m tall building. The angle of elevation from his eyes to the top of the building increase from 30◦ to 60◦ as he walks towards the building. Find the distance he walked towards the building. — 3

AB= 30-1.5=28.5 cm

In ΔABD : $-\tan 30^\circ = \frac{AB}{BD}$

$\Rightarrow BD = (28.5)\sqrt{3}$

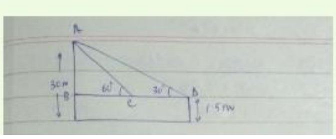
In ΔABC : $-\tan 60^\circ = \frac{AB}{BC}$

$\Rightarrow BC = \frac{(28.5)}{\sqrt{3}}$

CD= BD-BC

$= 28.5(\sqrt{3} - \frac{1}{\sqrt{3}})$

$= 28.5(\frac{2}{\sqrt{3}}) = 32.91m$



30. Find the median of the following frequency distribution (3 marks)

CLASS	0 – 10	10 – 20	20 – 30	30 – 40	40 – 50	50 – 60	60 - 70
FREQ	8	7	15	20	12	8	10

Class	freq	cf
0-10	8	8
10-20	7	15
20-30	15	30
30-40	20	50
40-50	12	62
50-60	8	70
60-70	10	80

$\frac{n}{2} = 40$

$l = 30$

$f = 20$

$cf = 30$

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

$$= 30 + \left(\frac{40 - 30}{20}\right) \times 10$$

$$= 30 + 5 = 35$$

31. Two different dice are thrown together. Find the probability that the numbers obtained (3 marks)

a. Have a sum less than 7
b. Have a product less than 16
c. Is a doublet of odd numbers

Total number of all possible outcomes = $6^2 = 36$

(i) The sum less than 7 = (1, 1), (1, 2), (1, 3), (1, 4), (1, 5)
= (2, 1), (2, 2), (2, 3), (2, 4), (3, 1), (3, 2), (3, 3), (4, 1), (4, 2), (5, 1)

No. of favourable out outcomes = 15

P(have sum less than 7) = $\frac{15}{36} = \frac{5}{12}$

(ii) Product less than 16 = (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, 4), (3, 5), (4, 1), (4, 2), (4, 3), (5, 1), (5, 2), (5, 3), (6, 1), (6, 2)

No. of favourable out outcomes = 24

P(have a product less than 16)

$= \frac{24}{36} = \frac{2}{3}$

(iii) Doublet of odd numbers = (1, 1), (1, 3), (1, 5), (3, 1), (3, 3), (3, 5), (5, 1), (5, 3), (5, 5)

No. of favourable outcomes = 9

∴ P(a doublet of odd number)

= 9/90 = 1/10

	SECTION D	
	SECTION D CONSISTS OF 4 QUESTIONS OF 5 MARKS EACH	
32.	Solve the following pair of linear equations graphically: $2x + y = 4$ $2x - y = 4$ Also find the coordinates of the vertices of the triangle formed by the lines with Y – axis and also find the area of the triangle.	5

Table for line $2x + y = 4$

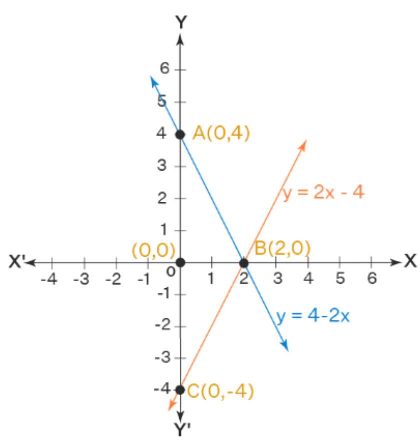
$y = 4 - 2x$.

x	0	2
y	4	0

Table for line $2x - y = 4$

$y = 2x - 4$.

x	0	2
y	-4	0



In this, both lines and y-axis form ΔABC.

Hence, the vertices of a ΔABC are A(0, 4), B(2, 0) and C(0, - 4)

The area of $\Delta ABC = 2 \times$ Area of ΔAOB

The area of $\Delta ABC = 2 \times 1/2 \times 4 \times 2 = 8$sq units.

Therefore, the area of the triangle is 8 sq units.

Or

Points A and B are 100 km apart on a highway. One car starts from A and another from B at the same time. If they travel in same direction at different speeds, they meet in 5 hours. If they travel towards each other, they meet in 1 hour. What are the speeds of the two cars?

Let the speed of car at A be x kmph
and the speed of car at B be y kmph

when the car travel in same direction Relative Speed is x − y
Dist = 100km
t = 5 hours
∴ Dist = S × T
100 = (x − y)5
x − y = 20 ⟶ (I)

when car travel in opp direction Relative Speed is x + y
Dist = 100km
t = 1 hours
Dist = ST
100 = (x + y)1
x + y = 100 ⟶ (II)

Solving (I) & (II)
x − y = 20
x + y = 100
2x = 120
x = 60km/h
y = 40km/h

Speed of the car at A = 60 km/h
Speed of the car at B = 40 km/h
The difference of speeds is 60 − 40 = 20

33. The ratio of the 11th term to 17th term of an AP is 3:4. **5**

a. Find the ratio of 5th term to 21st term of the same AP.
b. Also find the ratio of the sum of first 5 terms to that to first 21 terms

98. Given, $\frac{a_{11}}{a_{17}} = \frac{3}{4}$

$\Rightarrow \frac{a+10d}{a+16d} = \frac{3}{4}$

$\Rightarrow 4(a+10d) = 3(a+16d)$

$\Rightarrow 4a + 40d = 3a + 48d$

$\Rightarrow 4a + 40d - 3a - 48d = 0 \Rightarrow a = 8d$

Also, $\frac{a_5}{a_{21}} = \frac{a+4d}{a+20d}$

$= \frac{8d+4d}{8d+20d}$

$= \frac{12d}{28d} = \frac{3}{7}$ i.e., 3 : 7

Required ratio $= \frac{S_5}{S_{21}}$

$= \frac{\frac{5}{2}[2a+(5-1)d]}{\frac{21}{2}[2a+(21-1)d]} = \frac{5[2a+4d]}{21[2a+20d]}$

$= \frac{5[2(8d)+4d]}{21[2(8d)+20d]}$

$= \frac{5\times 20d}{21\times 36d} = \frac{25}{189}$ i.e., 25 : 189

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Or

a. Find the sum of first 20 terms of an AP in which d = 5 and a_{20} = 135

Given, d = 5

$\Rightarrow a_{20} = 135$

$\Rightarrow a_1 + (20 - 1)(5) = 135$

$\Rightarrow a_1 = 40$

$\therefore S_{20} = \frac{n}{2}[2 * a_1 + (n-1)d]$

$= \frac{20}{2}[2 * 40 + 19 * 5]$

= 1750

b. The 16th term of an AP is 5 times its third term. If its 10th term is 41, then find the sum of its first fifteen terms

91. Let a be the first term and d be the common difference of the A.P. $\therefore$ $a_n = a + (n-1)d$

Here, $a_{16} = 5 \times a_3$

$\Rightarrow a + (16-1)d = 5[a + (3-1)d] \Rightarrow a + 15d = 5a + 10d$

$\Rightarrow 4a = 5d \Rightarrow a = \frac{5d}{4}$

Also, $a_{10} = a + 9d = 41$

$\Rightarrow 41 = \frac{5d}{4} + 9d \Rightarrow 41 = \frac{5d + 36d}{4} \Rightarrow d = 4$

$\therefore a = \frac{5 \times 4}{4} = 5$

Hence, A.P. is 5, 9, 13, ...

Now, sum of n terms, $S_n = \frac{n}{2}[2a + (n-1)d]$

$\therefore S_{15} = \frac{15}{2}[2 \times 5 + 14 \times 4] = \frac{15}{2}[10 + 56] = \frac{15}{2} \times 66 = 495$

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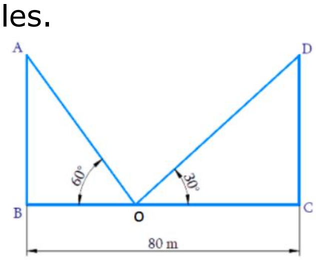
Two poles of equal heights are standing opposite to each other on either side of the road which is 80 m wide. From a point P between them on the road, the angle of elevation of the top of one pole is 60∘ and the angle of depression from the top of another pole at P is 30∘. Find the height of each pole and distances of the point P from the poles.



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	Let us consider the two poles of equal heights as AB and DC and the distance between the poles as BC. From a point O, between the poles on the road, the angle of elevation of the top of the poles AB and CD are 60° and 30° respectively. Let the height of the poles be x Therefore AB = DC = x In ΔAOB, tan 60° = AB/BO √3 = x / BO BO = x / √3 ....(i) In ΔOCD, tan 30° = DC / OC 1/√3 = x / (BC - OB) 1/√3 = x / (80 - x/√3) [from (i)] 80 - x/√3 = √3x x/√3 + √3x = 80 x (1/√3 + √3) = 80 x (1 + 3) / √3 = 80 x (4/√3) = 80 x = 80√3 / 4 x = 20√3 Height of the poles x = 20√3 m. Distance of the point O from the pole AB BO = x/√3 = 20√3/√3 = 20 Distance of the point O from the pole CD OC = BC - BO = 80 - 20 = 60 The height of the poles is 20√3 m and the distance of the point from the poles is 20 m and 60 m.	
35.	Solve for x: $\frac{1}{x+1} + \frac{3}{5x+1} = \frac{5}{x+4}$. x ≠ -1, $\frac{-1}{5}$, - 4	5

$$\frac{1}{x+1} + \frac{3}{5x+1} = \frac{5}{x+4}$$

$$(x+4)(5x+1) + 3(x+1)(x+4) = 5(x+1)(5x+1)$$

$$5x^2 + 21x + 4 + 3x^2 + 15x + 12 = 25x^2 + 30x + 5$$

$$8x^2 + 36x + 16 = 25x^2 + 30x + 5$$

$$-17x^2 + 6x + 11 = 0$$

$$x = \frac{-6 \pm \sqrt{6^2 - 4(-17)11}}{2(-17)}$$

$$x = -\frac{-6 \pm \sqrt{784}}{34}$$

$$x = -\frac{-6 \pm 28}{34}$$

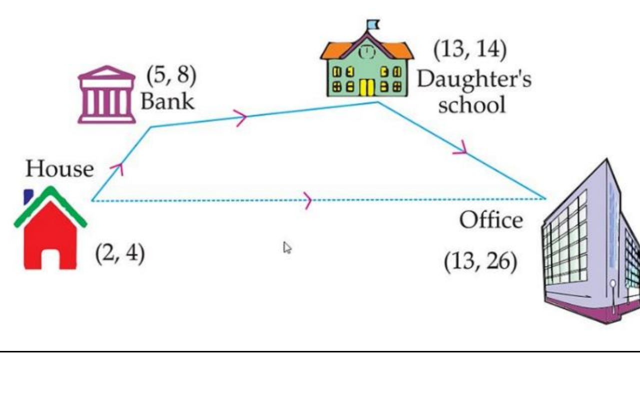
$$x = -\frac{11}{17}, 1$$

SECTION E

CASE BASED QUESTIONS

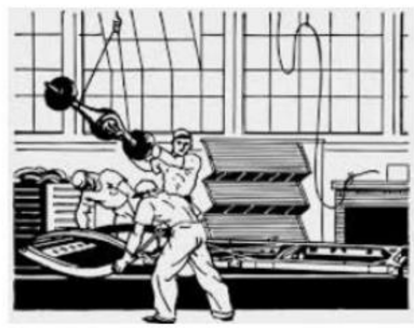
36. CASE STUDY 1:

Rajeev went out from his house to reach the office. But he had to get some work done before going to the office. So, he first of all went to the bank first, from there he went to his son's school, and then reaches to office. The position of home, school, bank and office on coordinate axis is shown in the following figure: (Assume that all distances covered are in straight lines). If the house is situated at (2, 4), bank at (5, 8), school at (13, 14) and office at (13, 26) and coordinates are in km, then answer the following questions:



<table>
<tr><td></td><td>a. If Rajeev goes directly from bank to his office, how much distance he would travel?</td><td>1</td></tr>
<tr><td></td><td>b.How much distance he will travel, if goes directly from home to the office?
Answer = $\sqrt{605}$ = 24.5km
Or

Find the distance of the point (-6, 8) from the origin
Answer = 10 units</td><td>2</td></tr>
<tr><td></td><td>c. If at the mid-point of the bank and school, there is a park, what are the coordinates of the park?
Answer = (9, 11)</td><td>1</td></tr>
<tr><td>37.</td><td>CASE STUDY:
As the demand of the products grew, a manufacturing company decided to hire more employees. For which they want to know the mean time required to complete the work for a worker.

The following table shows the frequency distribution of the time required for each worker to complete the work.

<table>
<tr><td>TIME IN HOURS</td><td>15 – 19</td><td>20 – 24</td><td>25 – 29</td><td>30 – 34</td><td>35 - 39</td></tr>
<tr><td>NUMBER OF WORKERS</td><td>10</td><td>15</td><td>12</td><td>8</td><td>5</td></tr>
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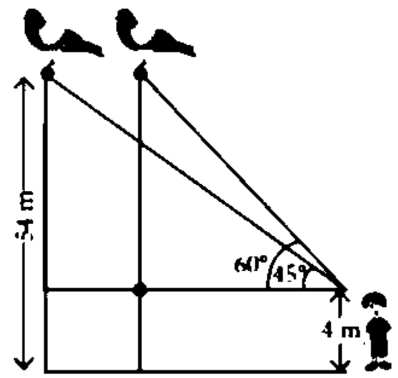
<tr><td></td><td>a. Find the mean time required to complete the work for a worker in hours
Answer : 25.3</td><td>1</td></tr>
<tr><td></td><td>B. Find mode of the data
Answer: 22.6
OR

Find median of the data.
Answer: 24.5</td><td>2</td></tr>
<tr><td></td><td>C. If a worker works for 8hrs a day, then find approximate time required to complete the work for a worker (in days)

Answer : 3 days</td><td>1</td></tr>
</table>

38.	CASE STUDY: A boy 4 m tall spots a pigeon sitting on the top of a pole of height 54m from the ground. The angle of elevation of the pigeon from the eyes of boy at any instant is 60^0. The pigeon flies away horizontally in such a way that it remained at a constant height from the ground. After 8 seconds, the angle of evaluation of the pigeon from the same point is 45^0. Based on the above information answer the following questions (take $\sqrt{3}$ = 1.73  POLE	
	i. If the distance between the positions of pigeon increases, then the angle of elevation (a) Increases (b) Decreases (c) Remains unchanged (d) can't say	1
	ii. Find the distance between the boy and the pole. (a) 50m (b) $\frac{50}{\sqrt{3}}m$ (c) $50\sqrt{3}m$ (d) $60\sqrt{3}$ Or How much distance the pigeon covers in 8 seconds? (a) 12.13m (b) 19.60m (c) 21.09m (d) 26.32m	2
	iii. Find the distance of first position of the pigeon from the eyes of the boy (a) 54m (b) 100m (c) $\frac{100}{\sqrt{3}}m$ (d) $100\sqrt{3}$	1