

K. R. MANGALAM WORLD SCHOOL, GK-II FIRST TERM EXAMINATION (2025-26)

CLASS X /MATHEMATICS/SET 2

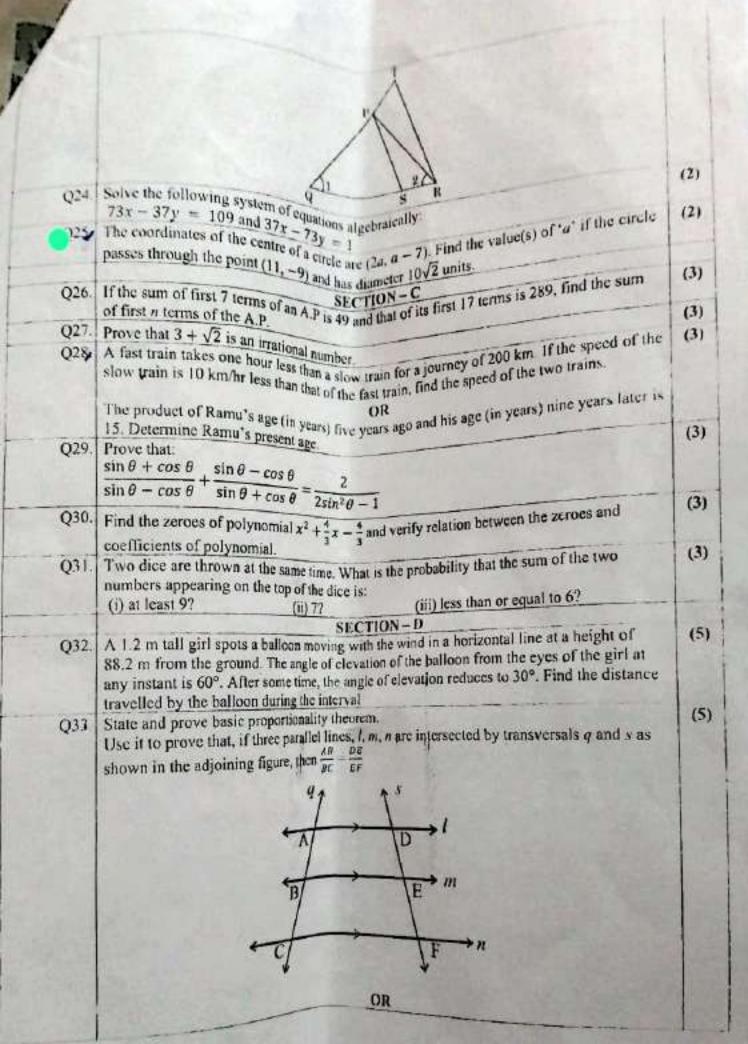
TIME: 3 His. General Instructions: 1. This Question Paper has 5 Sections A-E, 1. This Question A has 20 MCQs carrying 1 mark each 2. Section B has 5 questions carrying 02 marks each. 3. Section C has 6 questions carrying 03 marks each. 5. Section D has 4 questions control of and the cach.

6. Section E has 3 case based integrated units of assessment (04 marks each) with subparts of the values of 1, 1 and 2 marks each respectively. SECTION-A If $a = 2^2 \times 3^x$, $b = 2^2 \times 3 \times 5$, $c = 2^2 \times 3 \times 7$ and LCM (a, b, c) = 3780, then x is equal to: (1) A bag has ₹5 coins and ₹10 coins in the ratio 1:4. A coin is picked at random. Find the (1) probability of getting a \$10 coin 02 (d) + The shortest distance (in units) of the point (2,3) from y-axis is: (1) (d) 5 If AABC -ADEF, AB = 6 cm. DE = 6 cm. EF = 9 cm and FD = 12 cm, then the perimeter 03. (1) 04. of AABC is: (c) 23 cm (d) 18 cm (b) 27 cm The equation $2x^2 + kx + 5 = 0$ has real roots, if: (1) (b) k² ≥ 40 (c) $k^2 = 40$ (d) no real roots Q5. (a) $k^2 \le 40$ If $\sec \theta + \tan \theta - x$, then $\sec \theta - \tan \theta$ will be is equal to. (1) (d) 2 O6. (c) x If mean and mode of given set of observations are 10 and 13 respectively, then the value of 11 median is: (d) 43 (0)11 (b) 4 In $\triangle ABC$, DE || AB. If AB = a, DE = x, BE = b and EC = c. Then r expressed in terms of a 08. bunde is: $(d)\frac{ab}{b+c}$ (b) ac (a) ac Q9. In an MCQ test, a student guesses the correct answer x out of y times. If the probability that the student guesses the answer to be wrong is 1, then what is the relation between x and y? (b) x = 3y (c) 3x = 2y(d) 2x = 3yQ10. If a and b are co-prime numbers, then a and b are: (a) even (b) co-prime (c) odd (d) not co-prime Q11. The value of 'c' for which the pair cx - y = 2 and 6x - 2y = 3 will have infinitely

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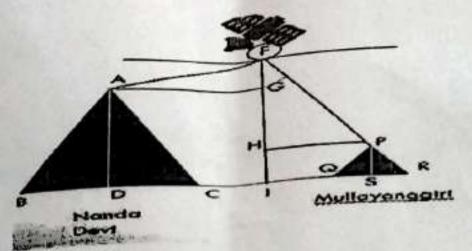
many Solutions is:

(a) x-axis (b) y-axis (c) origin (d) neither x-axis nor y-axis (e) origin (1) If nand β are the zeros of the polynomial 2x² - 3x + 1, then find the value of \(\frac{1}{n} + \frac{1}{8} \) is: (a) \(\frac{2}{n} \) (b) \(\frac{2}{n} \) (c) \(\frac{1}{2} \) (d) 3 Q14. If \(\frac{1}{n} \) 0 + \(\cot \frac{0}{n} \) (b) \(\frac{2}{n} \) (c) \(\frac{1}{2} \) (c) \(\frac{1}{2} \) (d) 3 Q15. The value of \(\frac{1}{n} \) or which \(\ax^2 + x + a = 0 \) has equal and positive roots is: (a) \(2 \) (b) \(-2 \) (c) \(\frac{1}{2} \) (d) \(\frac{1}{2} \) (1) Q16. The mean of the following data is 15. What is the value of x? Value	-		0.12	(c) -12	(d) no value of c	14.0
(a) 3-saxis (c) origin (b) origin (c) origin (c) origin (d) neither x-axis nor y-axis (e) and β are the zeros of the polynomial 2x² - 3x + 1, then find the value of \(\frac{1}{a} + \frac{1}{β} \) is: (a) \(\frac{2}{a} \) (b) \(\frac{2}{a} \) (c) \(\frac{1}{2} \) (d) 3 (1) Q14. If tan 0 + cot 0 = 2, then the value of \(\frac{1}{4} \) 0 + cot \(\theta \) is: (a) 0 (b) 2 (c) 4 (d) 6 Q15. The value of \(\frac{1}{a} \) for which \(\alpha x^2 + x + a = 0 \) has equal and positive roots is: (a) 2 (b) -\(\frac{1}{2} \) (d) \(\frac{1}{2} \) (d) Palue 10 15 20 Frequency 3 5 x (a) 2 (b) 3 (c) 5 (d) 4 Q17. A kite is flying at a height of 150 m from the ground. It is attached to a string inclined at an angle of 30°. The length of the string is: (a) \(\frac{1}{2} \) (20\sqrt{3} m (b) \(\frac{1}{2} \) (b) \(\frac{1}{2} \) (c) 300 m (d) \(\frac{1}{2} \) (30 \(\frac{3}{3} \) m (1) Q18. In triangles ABC and \(\text{DEF}_{\text{ZB}} = \text{ZE}_{\text{ZF}} = \text{ZC} \) and \(\text{AB} = 3DE. \) Then, the two triangles are: (a) \(\frac{1}{2} \) (original not similar (b) congruent as well as similar (c) neither congruent nor similar (d) similar but not congruent DIRECTIONS: In the question number 19 and 20, a statement of Assertion (A) is followed by a statement of Renson (R). Choose the correct option: (a) \(\frac{1}{2} \) (a) and reason (R) are true and reason (R) is the correct explanation of assertion (A) (b) \(\frac{1}{2} \) (b) and reason (R) are true and reason (R) is not the correct explanation of assertion (A) (c) \(\text{Assertion} \) (A) and reason (R) is false: (d) \(\text{Assertion} \) (A) is false but reason (R) is finise: (d) \(\text{Assertion} \) (A) is false but reason (R) is finise: (d) \(\text{Assertion} \) (A) is false but reason (R) is finise: (d) \(\text{Assertion} \) (A) is false but reason (R) is finise: (d) \(\text{Assertion} \) (A) is false but reason (R) is finise: (d) \(\text{Assertion} \) (A) is false but reason (R) is finise: (d) \(\text{Assertion} \) (A) (- Gran	(a) -3	(b) 3	ning the points P/ 4	5) and O(4, 6) lies on:	(0)
(a) 3-3x/s (c) origin (b) origin (c) origin (c) origin (d) a control by anothe zeros of the polynomial 2x² - 3x + 1, then find the value of \(\frac{1}{u} + \frac{1}{8} \) is: (a) \(\frac{2}{2} \) (b) \(\frac{2}{3} \) (c) \(\frac{1}{2} \) (d) 3 (1) Q14. If tan 0 + cot 0 = 2, then the value of tan² 0 + cot²θ is: (a) 0 (b) 2 (c) 4 (d) 6 Q15. The value of 'a' for which αx² + x + x = 0 has equal and positive roots is: (a) 2 (b) -2 (c) \(\frac{1}{2} \) (d) \(\frac{-1}{2} \) (a) 2 (b) -2 (c) \(\frac{1}{2} \) (d) \(\frac{-1}{2} \) (a) 2 (b) 3 (c) 5 (d) 4 Q16. The mean of the following data is 15. What is the value of x? Value 10 15 x (a) 2 (b) 3 (c) 5 (d) 4 Q17. A kite is flying at a height of 150 m from the ground. It is attached to a string inclined at an angle of 30°. The length of the string is: (a) 100√3 m (b) 150√2 m (c) 300 m (d) 150√3 m Q18. In triangles ABC and DEF, ∠B = ∠E, ∠F = ∠C and AB = 3DE. Then, the two triangles are: (a) 200√3 m (b) 150√2 m (c) 300 m (d) 150√3 m (b) congruent but not similar (b) congruent as well as similar (c) neither congruent nor similar (d) similar but not congruent DIRECTIONS: In the question number 19 and 20, a statement of Assertion (A) is followed by a statement of Reason (R). Choose the correct option: (a) 80th 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 and reason (R) is not the correct explanation of assertion (A) (c) Assertion (A) is false but reason (R) is false: (d) Assertion (A) is false but reason (R) is frue. Statement A (Assertion): The HCF of two numbers is 6 and their product is 18144, then their LCM is 3024. Statement A (Assertion): The point (-1,6) divides the line segment joining the points (-3,10) and (6,-8) in the ratio 2.7 internally. Statement R(Reason): HCF × LCM = Product of two given numbers. (200. Statement A (Assertion): The point (-1,6) divides the line segment joining the points (-3,10) and (6,-8) in the ratio 2.7	QL	2. The mid-point of th	ie line segment	(b) y-axis	S) and Q(4, 6) her	10.0
		NEAD TO THE PARTY OF THE PARTY		(d) neither v.	axis nor p-axis	(1)
(a) $\frac{2}{2}$ (b) $\frac{2}{5}$ (c) $\frac{1}{2}$ (d) $\frac{3}{5}$ (1) Q14. If $\tan 0 + \cot 0 = 2$, then the value of $\tan^2 0 + \cot^2 0$ is: (a) 0 (b) 2 (c) 4 (d) 6 Q15. The value of 'a' for which $ax^2 + x + a = 0$ has equal and positive roots is: (a) 2 (b) $-\frac{2}{2}$ (c) $\frac{1}{2}$ (d) $-\frac{1}{2}$ Q16. The mean of the following data is 15. What is the value of x ? Yalue 10 15 20 Yalue 10 15 20 A kite is flying at a height of 150 m from the ground. It is attached to a string inclined at an angle of 30°. The length of the string is: (a) 100√3 m (b) 150√2 m (c) 300 m (d) 150√3 m Q18. In triangles ABC and DEF, ∠B = ∠E, ∠F = ∠C and AB = 3DE. Then, the two triangles are: (a) congruent but not similar (b) congruent as well as similar (c) neither congruent nor similar (d) similar but not congruent DIRECTIONS: In the question number 19 and 20, a statement of Assertion (A) is followed by a statement of Reason (R). Choose the correct option: (a) Both assertion (A) and reason (R) are true and reason (R) is the correct explanation of assertion (A) is false. (b) Assertion (A) is false but reason (R) are true and reason (R) is not the correct explanation of assertion (A) is false but reason (R) is false. (d) Assertion (A) is false but reason (R) is rue. Statement A (Assertion): The HCF of two numbers is 6 and their product is 18144, then their LCM is 3024. Statement R(Reason): HCF × LCM = Product of two given numbers. Q20. Statement A (Assertion): The point (−1,6) divides the line segment joining the points (−3,10) and (6,−8) in the ratio 2.7 internally. Statement R(Reason): Three points A, B and C are collinear if AB + BC = AC	0.00	(c) origin	Calles multipade	mial $2x^2 - 3x + 1$	han find the value of 1 + 1 (s:	420
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Q17. A kite is flying at a height of 150 m from the ground. It is attached to a string inclined at an angle of 30°. The length of the string is: (a) 100√3 m (b) 150√2 m (c) 300 m (d) 150√3 m Q18. In triangles ABC and DEF, ∠B = ∠E, ∠F = ∠C and AB = 3DE. Then, the two triangles are: (a) congruent but not similar (b) congruent as well as similar (c) neither congruent nor similar (d) similar but not congruent DIRECTIONS: In the question number 19 and 20, a statement of Assertion (A) is followed by a statement of Renson (R). Choose the correct option: (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 and 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 rue. Q19. Statement A (Assertion): The HCF of two numbers is 6 and their product is 18144, then their LCM is 3024. Statement R(Reason): HCF × LCM = Product of two given numbers. Q20. Statement A (Assertion): The point (-1.6) divides the line segment joining the points (-3,10) and (6,-8) in the ratio 2:7 internally. Statement R(Reason): Three points A, B and C are collinear if AB + BC = AC SECTION - B		requency	- 1	-		1
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Evaluate the following: $\frac{tan^260^{\circ}}{sin^260^{\circ} + cos^230^{\circ}}$ 322. One eard is drawn from a well shuffled deck of 52 cards. Find the probability of getting:	Q20.	(a) Both assertion (A) (b) Both assertion (A) (c) Assertion (A) (d) Assertion (A) is (d) Assertion (A) is (d) Assertion (A) is Statement A (Assertion LCM is 3024. Statement R(Reason Statement A (Assertion (A)) Statement R(Reason (B)) Statement R(A) and reason (R) A) and reason (R) true but reason (F) false but reas	are true and reason (i) is false. (R) is true. (of two numbers is 6) = Product of two gives (-1,6) divides the liternally. (A, B and C are collimated by the find the t	(R) is not the correct explanation and their product is 18144, then wen numbers, the segment joining the points the near if $AB + BC = AC$ value of $x + 2y$.	(1)
Evaluate the following: tan ² 60° sin ² 60° + cos ² 30° One card is drawn from a well shuffled deck of 52 cards. Find the probability of getting: (i) a face card or a black card (ii) neither an ace nor a king	Q20.	(a) Both assertion (A) (b) Both assertion (A) (c) Assertion (A) (d) Assertion (A) is (d) Assertion (A) is (d) Assertion (A) is Statement A (Assertion LCM is 3024. Statement R(Reason Statement A (Assertion A) Statement R(Reason C) Statement R(A) and reason (R) A) and reason (R) true but reason (R) false but reason (R) rtion): The HCF n): HCF × LCM rtion): The point in the ratio 2:7 in in in in the ratio 2:7 in	are true and reason (i) is false. (ii) is true. (of two numbers is 6) = Product of two gives the liternally. (iii) neither and deck of 52 cards. (iii) neither and care collimaternally.	(R) is not the correct explanation and their product is 18144, then wen numbers, the segment joining the points mear if $AB + BC = AC$ value of $x + 2y$.	(1)
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Evaluate the following: $\frac{\tan^2 60^{\circ}}{\sin^2 60^{\circ} + \cos^2 30^{\circ}}$ 322. One eard is drawn from a well shuffled deck of 52 cards. Find the probability of getting: (i) a face eard or a black card (ii) neither an ace nor a king (23. If $\triangle ABC - \triangle PQR$ in which $\triangle AB = 6$ cm, $\triangle BC = 4$ cm, $\triangle C = 8$ cm and $\triangle PR = 6$ cm, then find	Q20.	(a) Both assertion (A) (b) Both assertion (A) (c) Assertion (A) (d) Assertion (A) is (d) Assertion (A) is (d) Assertion (A) is Statement A (Assertion LCM is 3024. Statement R(Reason Statement R(Reason Control of Control	A) and reason (R) A) and reason (R) true but reason (R) false b	are true and reason R) is false. R) is true. of two numbers is 6 = Product of two gi (-1,6) divides the liternally. A, B and C are collicated by the second of the collicated by the collicat	(R) is not the correct explanation and their product is 18144, then wen numbers, the segment joining the points mear if $AB + BC = AC$ value of $x + 2y$.	(1)
OR	Q19.	(a) Both assertion (A) (b) Both assertion (A) (c) Assertion (A) (d) Assertion (A) is (d) Assertion (A) is Statement A (Assertion LCM is 3024.	A) and reason (R) A) and reason (R) true but reason (I false but reason (rtion): The HCF	are true and reason () is false. (R) is true. of two numbers is 6	(R) is not the correct explanation and their product is 18144, then	
	Q20.	(a) Both assertion (A) (b) Both assertion (A) (c) Assertion (A) (d) Assertion (A) is (d) Assertion (A) is Statement A (Assertion LCM is 3024. Statement R(Reaso Statement A (Assertion (A)) and (6,-8) is Statement R(Reaso	A) and reason (R) A) and reason (R) true but reason (I) false but reason (II)	are true and reason (a) is false. (b) is false. (c) is true. (c) of two numbers is 6 (c) = Product of two gives (c) divides the liternally. (c) A, B and C are colliced to the second of two second of two gives of two second of two gives of two second of two secon	(R) is not the correct explanation and their product is 18144, then wen numbers, the segment joining the points the near if AB + BC = AC	(1)
	Q20.	(a) Both assertion (A) (b) Both assertion (A) (c) Assertion (A) (d) Assertion (A) is (d) Assertion (A) is (d) Assertion (A) is Statement A (Assertion LCM is 3024. Statement R(Reason Statement A (Assertion (A)) and (6,-8) is Statement R(Reason Statement R(Reaso	A) and reason (R) A) and reason (R) true but reason (R) false son (R)	are true and reason (a) is false. (b) is false. (c) is true. (c) of two numbers is 6 (c) = Product of two gives (c) divides the liternally. (c) A, B and C are colliced to the second of two second of two gives of two second of two gives of two second of two secon	(R) is not the correct explanation and their product is 18144, then wen numbers, the segment joining the points the near if AB + BC = AC	(1)
Evaluate the following:	Q20.	(a) Both assertion (A) (b) Both assertion (A) (c) Assertion (A) (d) Assertion (A) is (d) Assertion (A) is Statement A (Assertion LCM is 3024. Statement R(Reason Statement A (Assertion (A)) and (6,-8) is Statement R(Reason Evaluate the following	A) and reason (R) A) and reason (R) true but reason (R) false son (R)	are true and reason (a) is false. (b) is false. (c) is true. (c) of two numbers is 6 (c) = Product of two gives (c) divides the liternally. (c) A, B and C are colliced to the second of two second of two gives of two second of two gives of two second of two secon	(R) is not the correct explanation and their product is 18144, then wen numbers, the segment joining the points the near if AB + BC = AC	(1)
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Evaluate the following: $tan^2 60^{\circ}$ $sin^2 60^{\circ} + cos^2 30^{\circ}$	Q20.	(a) Both assertion (A) (b) Both assertion (A) (c) Assertion (A) (d) Assertion (A) is (d) Assertion (A) is Statement A (Assertion LCM is 3024. Statement R(Reaso Statement R(Re	A) and reason (R) A) and reason (R) Iruc but reason (I false but	are true and reason (a) is false. (b) is true. (c) is true. (d) is true. (e) is true. (d) is true. (e) is tr	(R) is not the correct explanation and their product is 18144, then wen numbers, the segment joining the points mear if $AB + BC = AC$ value of $x + 2y$.	(1)
Evaluate the following: $\frac{tan^260^{\circ}}{sin^260^{\circ} + cos^230^{\circ}}$ 322. One eard is drawn from a well shuffled deck of 52 cards. Find the probability of getting:	Q20.	(a) Both assertion (A) (b) Both assertion (A) (c) Assertion (A) (d) Assertion (A) is (d) Assertion (A) is (d) Assertion (A) is Statement A (Assertion LCM is 3024. Statement R(Reason Statement A (Assertion (A)) Statement R(Reason (B)) Statement R(A) and reason (R) A) and reason (R) true but reason (F) false but reas	are true and reason (i) is false. (R) is true. (of two numbers is 6) = Product of two gives (-1,6) divides the liternally. (A, B and C are collimated by the find the t	(R) is not the correct explanation and their product is 18144, then wen numbers, the segment joining the points the near if $AB + BC = AC$ value of $x + 2y$.	(1)
Evaluate the following: tan ² 60° sin ² 60° + cos ² 30° One card is drawn from a well shuffled deck of 52 cards. Find the probability of getting: (i) a face card or a black card (ii) neither an ace nor a king	Q20.	(a) Both assertion (A) (b) Both assertion (A) (c) Assertion (A) (d) Assertion (A) is (d) Assertion (A) is (d) Assertion (A) is Statement A (Assertion LCM is 3024. Statement R(Reason Statement A (Assertion A) Statement R(Reason C) Statement R(A) and reason (R) A) and reason (R) true but reason (R) false but reason (R) rtion): The HCF n): HCF × LCM rtion): The point in the ratio 2:7 in in in in the ratio 2:7 in	are true and reason (i) is false. (ii) is true. (of two numbers is 6) = Product of two gives the liternally. (iii) neither and deck of 52 cards. (iii) neither and care collimaternally.	(R) is not the correct explanation and their product is 18144, then wen numbers, the segment joining the points mear if $AB + BC = AC$ value of $x + 2y$.	(1)
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-	If AD and PM are medians of triangles ABC and PQR, respectively where AABC - APQR.	1				
	If AD and PM are medians of this state of the state of th	m				
	Prove that $\frac{AB}{PQ} = \frac{AD}{PM}$					
034	The sum of a two-digit number and the number obtained by reversing the order of its digits	(5				
4.00	is 99. If the digits differ by 3, find the number.	1				
	OR CONTRACTOR OF THE PROPERTY	16.				
	The boat goes 30 km upstream and 44km downstream in 10 hours. In 13 hours, it can go	110				
	40km upstream and 55 km downstream. Determine the speed of the stream and that of					
	the boat in still water.					
Q35	The mean of the following data is 42. Find the missing frequencies x and y, if the sum of	(5				
	frequencies is 100. Also, find the median.					
	Class 0-10 10-20 20-30 30-40 40-50 50-60 60-70 70-80					
	Frequency 7 10 3 13 v 10 14 9	13				
		1				
	(SECTION E)					
Q36	Section E consists of 3 case study-based questions of 4 marks each.	74				
400	The following graph shows the number of persons in family in a locality.	(4				
	140					
	120 B C					
		1				
	100 / E					
	60 0					
	10 1	1				
	40 fA					
	20					
	н н					
	7 1 2 1 4 5 6 2 6 5	1				
	Observe the graph and answer the following questions:	1				
	A Find the midpoint of the line segment joining F16 600 and com-	1				
	ii. Find the length of line segment CD. iii. Find the point on x-axis which is equidistance from D and E. (1)	1				
		10				
35	iii Find the coordinate of the text to the text					
Q37.	Ms. Sheela visited a store near her house and found that the glass jars are arranged one above the other in a specific pattern. On the top lever the					
	one above the other in a specific pattern. On the top layer there are 3 jars. In the next	(4				
	layer there are 6 jars. In the 3rd layer from the top there are 9 jars and so on till the 8th					
	On the basis of the state of th					
	On the basis of the above situation, answer the following questions,					
	Write an A Purhase town					
1	Write an A P whose terms represent the number of jars in different layers starting	!				
	it. Is it possible to arrange 34 jars in a layer if this pattern.	1				
	answer.	1				
113	II. II there are 'n' number of round a state (1)					
	total number of jars in terms of n. Hence, find Ss.	1				
	100	1				
	ii. The shopkeeper added 3 jars in each layer. How many jars are there in the 5th layer	1				
	The state of the s	4				

Q38. A Satellite flying at height h is watching the top of the two tallest mountains in Uttarakhand and Karnataka, them being Nanda Devi(height 7,816m) and Mullayanagiri (height 1,930 m). The angles of depression from the satellite, to the top of Nanda Devi and Mullayanagiri are 30° and 60° respectively. If the distance between the peaks of the two mountains is 1937 km, and the satellite is vertically above the midpoint of the distance between the two mountains.



Based on given information, answer the questions:

- i. Find the distance of the satellite from the top of Nanda Devi? (D)
- ii. Find the distance of the satellite from the top of Mullayanagiri?
- iii. What is the distance of the satellite from the ground? (2)

iii. If a mile stone very far away from, makes 45° to the top of Mullanyangiri mountain. So, find the distance of this mile stone from the mountain,