ROLL No						

GUESS PAPER (2020-21)
MATHEMATICS
CLASS-X

TIME ALLOWED: 3 HRS MM-80

General Instructions:

1. This question paper contains two parts A and B.
2. Both Part A and Part B have internal choices.

Part – A:

1. It consists three sections- I and II.
2. Section I has 16 questions of 1 mark each. Internal choice is provided in 5 questions.
3. Section II has 4 questions on case study. Each case study has 5 case-based sub-parts. An examinee is to attempt any 4 out of 5 sub-parts.

Part – B:

1. Question No 21 to 26 are Very short answer Type questions of 2 mark each,
2. Question No 27 to 33 are Short Answer Type questions of 3 marks each
3. Question No 34 to 36 are Long Answer Type questions of 5 marks each.
4. Internal choice is provided in 2 questions of 2 marks, 2 questions of 3 marks and 1 question of 5 marks

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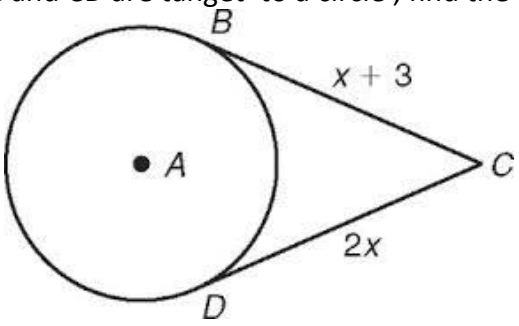
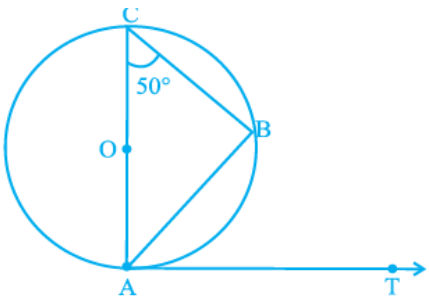
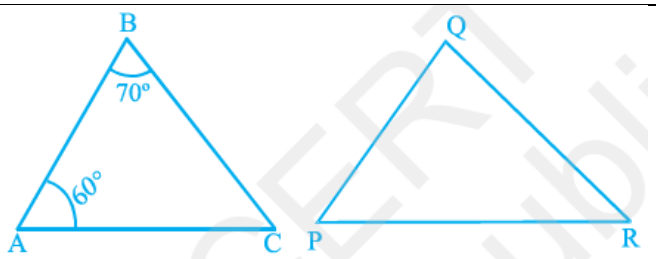
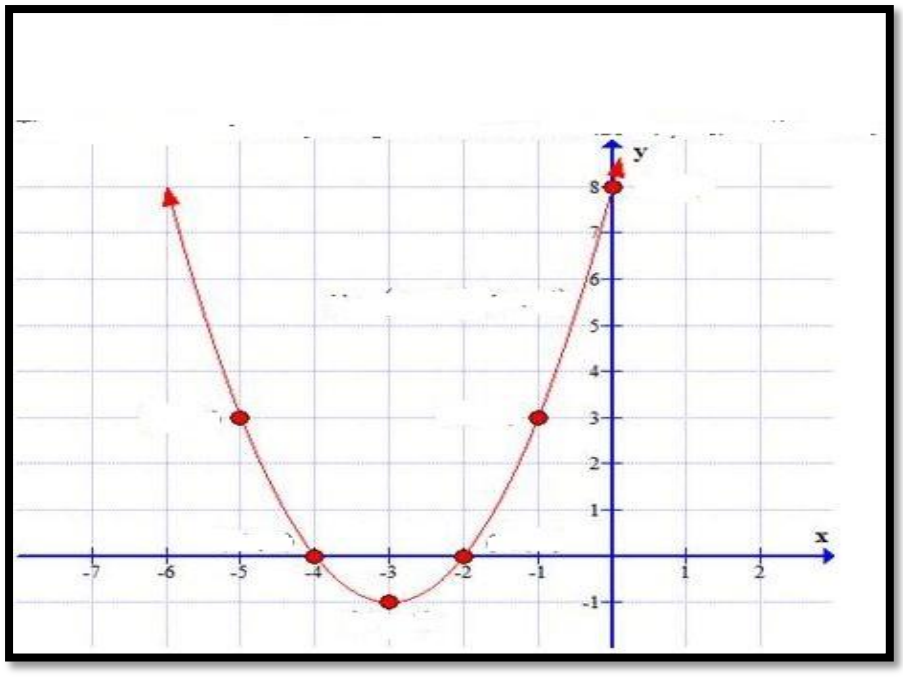
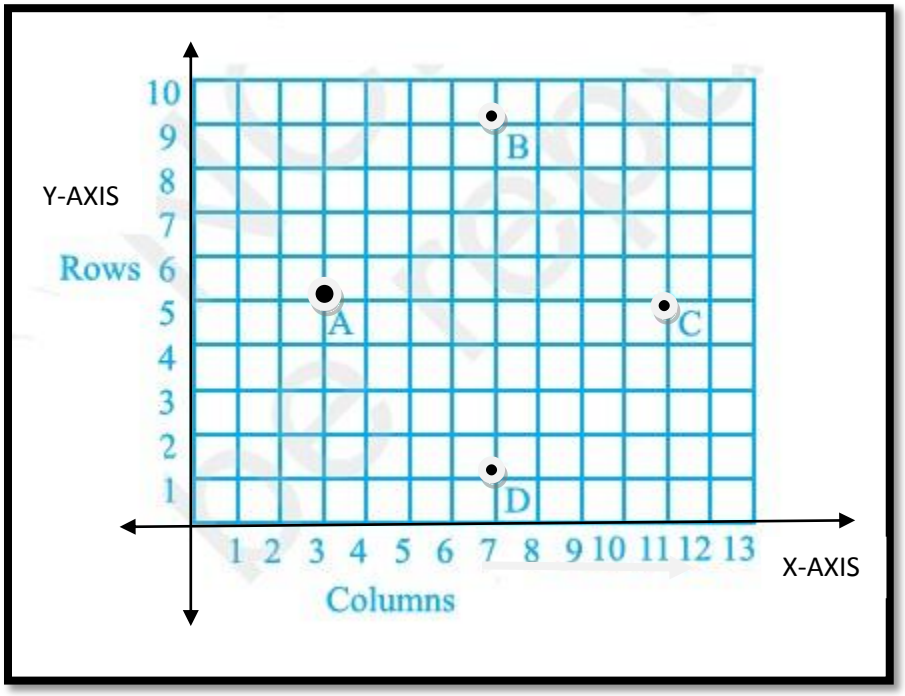
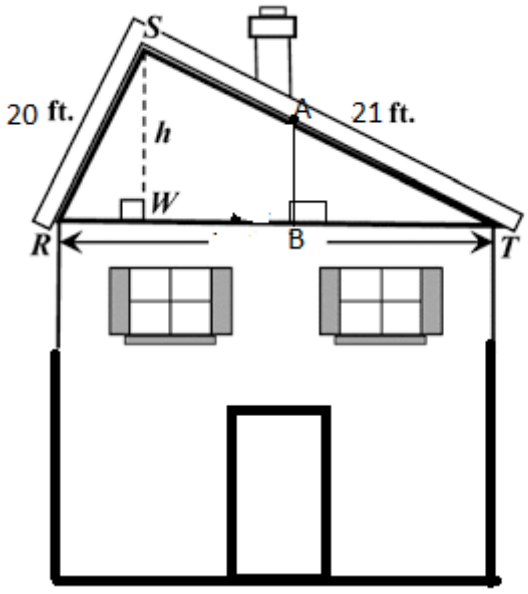
Q.N	**PART-A**	MARK
	SECTION-I	
1	If a tower 30 m high, casts a shadow 10 $\sqrt{3}$ m long on the ground , what is the angle of elevation of the sun ?	1
2	The mean and median of a distribution are 14 and 15 respectively, find the value of Mode .	1
3	In a Leap year , find the Probability of getting 53 Monday .	1
4	If HCF (336,54) =6 , find the LCM (336,54) OR Express 256 as a product of primes	1
5	Find the nature of the roots of the quadratic equation $4x^2+4\sqrt{3}x+3=0$	1

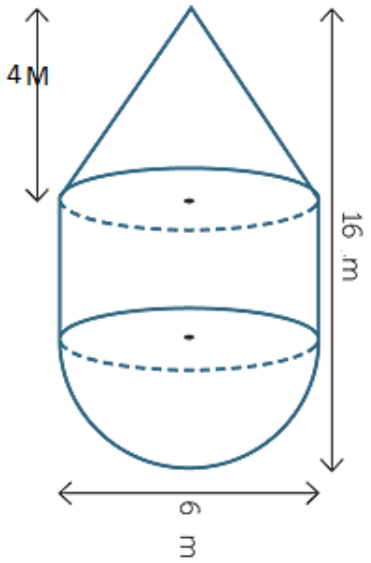
6	Explain 7 x 11 x 13 +13 is a composite number .	1
7	For what value of k the pair of linear equations $2x$ +ky = 1 and 3 x-5y = 7 has unique solution ?	1
8	If the n^{th} term of the A.P -1,4,9,14.....is 129 , find the value of n . **OR** If 2k , k+10 , 3k +2 are in A.P , find the value of k .	
9	The decimal representation of the given expression will terminate after how many decimal places ? $\frac{14587}{2^1 \times 5^4}$	
10	What is the total surface area of a solid hemisphere of radius r ? **OR** Volumes of two spheres are in the ratio 64:27. Find the ratio of their surface areas	
11	In the given figure , BC and CD are tanget to a circle , find the value of X .  **OR** In the given figure , AB is a chord and AOC is diameter If AT is the tangent to the circle at the point A, then find the measure of ∠BAT . 	1
12	If Sin A = 3/5 , find the value of (1+ $\cot^2$A)	1
13	If in the following figure, Δ ABC ~ Δ QPR, find the measure of ∠R	1

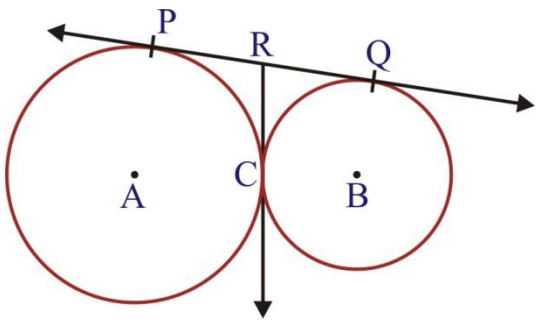


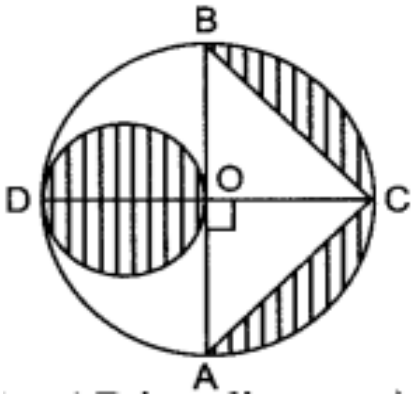
14	If circumference and area of a circle are equal then find the radius of a circle .	1
15	Three coins are tossed together , What is probability of getting at most Two heads ? **OR** A bag contains 4 Red balls, 6 Green balls and 5 Blue balls , A ball is picked up randomly from the bag. What is the probability that the ball drawn is not Green ball ?	1
16	Find the area of a quadrant of a circle whose radius is 7 cm.	1
	SECTION - II	
	Case study based questions are compulsory. Attempt any four sub parts of each question. Each subpart carries 1 mark	
17	A student bent the wire as shown in the figure. It followed a mathematical shape . answer the following question given below	
		
(I)	The above graph is of which type of polynomial	**1**

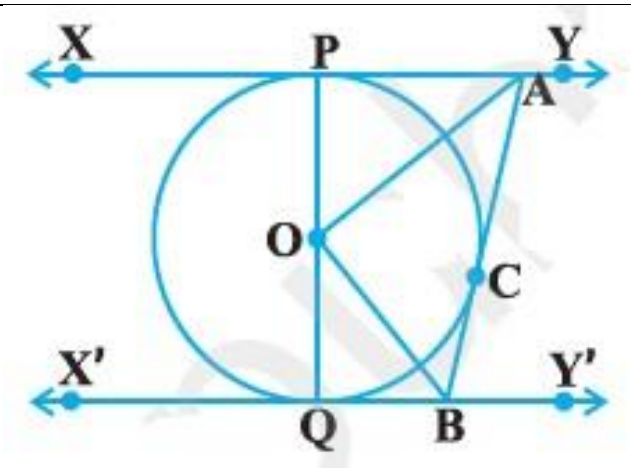
	(A) Linear (B) cubic (C) Bi-quadratic (D) Quadratic	
(II)	In the given figure , Number of zeroes of the polynomial P(x) are (A) 1 (B) 2 (C) 3 (D) 4	**1**
(III)	The zeroes of the polynomial are (A) -2 , -4 (B) -2,-4 ,-1 (C) -3 , -2 (D) 3 ,0	**1**
(IV)	What will be the expression of the polynomial (A) x^2-6x+8 (B) x^2-5x -6 (C) x^2-2x-8 (D) x^2+8x+6	**1**
(V)	What is the value of the Polynomial. If X = 2 (A) -8 (B) 26 (C) -12 (D) 0	**1**
18	**Students of a school are standing in rows and columns in their playground for a drill practice. A, B, C and D are the positions of four students as shown in figure**	
		
(I)	What are the coordinates of the position of D ? (A) (1,7) (C) (7,1) (B) (7,0) (D) (0,7)	1

(II)	What should be the position of Mr Dubey. A sports teacher in the drill in such a way that he is equidistant from each of the four students A, B, C and D? (A) (0,0) (C) (5,0) (B) (7,5) (D) (7,0)	1
(III)	What is the distance between A and B ? (A) $4\sqrt{2}$ unit (C) $\sqrt{8}$ unit (B) 16 unit (D) None of these	1
(IV)	If Origin is shifted to A then what is coordinates of the position of student D ? (A) (7,0) (C) (7,1) (B) (1,7) (D) (4,-4)	1
(V)	If Position of students A , B , C and D are joined , What shape would you get ? (A) Rhombus (C) Square (B) Rectangle (D) Trapezium	1
19	A house whose front view is shown below having some triangles such that RS = 20 FT, ST = 21ft and support pillars SW and AB are placed vertically on the a beam RT if the beams RS and TS are perpendicularly placed on each other at S.	
		
(I)	What is the length of beam RT ?	1

	(A) 29 ft (C) 31 ft (B) 41 ft (D) 39ft	
(II)	Which triangles is similarity is not written correctly (A)Δ TBA ~ Δ TSR (C) Δ TBA ~ Δ TWS (B) Δ TSR ~ Δ TSW (D) Δ STW ~ Δ RSW	1
(III)	What is the height of the longest support pillar ? (A) 420 ft (C) can't be calculated (B) 580 ft (D) 420/29 ft	1
(IV)	Which of the following is not similar criterion ? (A) AAA (C) SSS (B) ASA (D)SAS	1
(V)	If B IS the mid point of WT, then what is the length of AT ? (A) 10.5 ft (C) 14.5 ft (B) 10 ft (D) None of these	1
20	**An over head water storage tank is constructed for the supply of water in Rani Laxmi Nagar colony . conical part of the tank is for air.**	
	 	
(I)	The tank is of the combination of (from the top to bottom)	1

	(A) Cone-Frustum of cone-Cylinder (C) Hemisphere-Cylinder- Cone (B) Cone-Cylinder-Sphere (D) Cone- cylinder - hemisphere	
(II)	What is the Slant Height of conical part of the water Tank ? (A) 8m (C) 6 m (B) 5 m (D) 4 m	1
(III)	What is the capacity of tank ? (A) 158800π m^3 (C) 99000π liter (B) 180000π liter (D) 720000π liter	1
(IV)	What is the outer curved surface area of cylindrical part ? (A) 54 π square meter (C) 18π square meter (B) 96π square meter (D) 168π square meter	1
(V)	How much air can the upper conical part accommodate ? (A) 15 π m^3 (C) 27 π m^3 (B) 18 π m^2 (D) 15π m^2	1
Q No	**PART-B**	MM
	All questions are compulsory. In case of internal choices, attempt any one	
21	Find the sum 7+10+13+……..+46	2
22	A line intersects the y-axis and the x –axis at the point P and Q respectively. If (2,-5) is the mid-point of PQ , then find the coordinates of P and Q . **OR** In what ratio does the *x*–axis divide the line segment joining the points (– 4, – 6) and (–1, 7)?.	2
23	Diagonals of a trapezium ABCD with AB || DC intersect each other at the point O. If AB = 2 CD, find the ratio of the areas of triangles AOB and COD	2
24	In the Given figure PQ and RC are two common tangents to the circles with centre A and B , Prove that R is the mid point of PQ . 	2

25	If Sec 2A = cosec (A-30^0) , 0^0 <2A <90^0 , then find the value of ∠A .	2
26	Using ruler and compass , Divide a line segment of 8 cm in the ratio 3:5 .	2
Q No	**PART-B**	MM
	All questions are compulsory. In case of internal choices, attempt any one	
27	In the given figure there are two diameters AB and CD of a circles which are perpendicular to each other and OD is the diameter of the smaller circle. If OA = 7 cm, find the area of the shaded region. 	3
28	Prove that 4-5√2 is an irrational number .	3
29	From a pack of 52 playing cards , Black coloured face are removed. From the remaining cards , a card is drawn at random . Find the probability that the card drawn is (a) face card (b) A card of black color (c) An Ace card OR A box contains cards bearing numbers from 6 to 70. If one card is drawn at random from the box find the probability that it bears (a) A perfect square number (b) A prime number (c) An even number divisible by 3	3
30	Prove that $\frac{\tan\theta}{1-\cot\theta}+\frac{\cot\theta}{1-\tan\theta}=1+\sec\theta\ \text{cosec}\ \theta$	3
31	In the given figure, XY and X'Y' are two parallel tangents to a circle with centre O and another tangent AB with point of contact C intersecting XY at A and X'Y' at B. Prove that ∠AOB = 90°.	

		3
32	The difference of the square of two numbers is 88. If the larger number is 5 less than twice the smaller number, then find the two numbers .	3
33	The sum of numerator and denominator of a fraction is 3 less than twice the denominator. If each of the numerator and denominator is decreased by 1 , the fraction becomes $\frac{1}{2}$. find the fraction. **OR** Solve the equation graphically : $x - 2y = 0$ and $3x + 4y = 20$	3

Q No	**PART-B**	MM
	All questions are compulsory. In case of internal choices, attempt any one	
34	From the top of a 7 meter high building , the angle of elevation of the top of a tower is 60^0 and angle of depression of the foot of the tower is 30^0 find the height of the tower and the horizontal distance between the tower and building . OR The angle of elevation of the top of a tower from certain point is 30°. If the observer moves 20 metres towards the tower, the angle of elevation of the top increases by 15°. Find the height of the tower.	5

<table>
<tr><td>35</td><td>Find the Mean , Median and Mode of the following frequency distribution

<table><tr><th>CLASS INTERVAL</th><th>FREQUENCY</th></tr><tr><td>0-10</td><td>8</td></tr><tr><td>10-20</td><td>8</td></tr><tr><td>20-30</td><td>14</td></tr><tr><td>30-40</td><td>22</td></tr><tr><td>40-50</td><td>30</td></tr><tr><td>50-60</td><td>8</td></tr><tr><td>60-70</td><td>10</td></tr></table></td><td>5</td></tr>
<tr><td>36</td><td>If S_n denotes the sum of first n terms of an AP, prove that
$S_{12} = 3(S_8 - S_4)$</td><td>5</td></tr>
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