MATHEMATICS – JULY 2020 - MODEL PAPER

MATHEMATICS QUESTION PAPER – JULY 2020

(English Medium)

Class : X (Max. Marks : 10) Time : 03.15 Hrs.

Instructions :

1. **Answer all the questions in a separate answer booklet.**
2. **The question paper consists of 4 sections and 33 questions.**
3. **There is an internal choice in Section – IV.**
4. **Write answers neatly and legibly.**

Section - I

Note :

1. **Answer all the Questions in one WORD or PHRASE**
2. **Each Question carries 1 Mark. 12 × 1m = 12m**

1. Write the decimal expansion of $\frac{21}{25}$ without actual division.

2. Choose the correct answer satisfying the following conditions

   Statement (A) : G = { all the factors of 20 } = { 1, 2, 4, 5,10, 20}

   Statement (B) : F = {The multiples of 4 between 17 and 61 which are divisible by 7 }

   = { 7, 28, 56 }

   a) Both A and B are true
   b) A is true, B is false
   c) A is false, B is true
   d) Both A and B are false

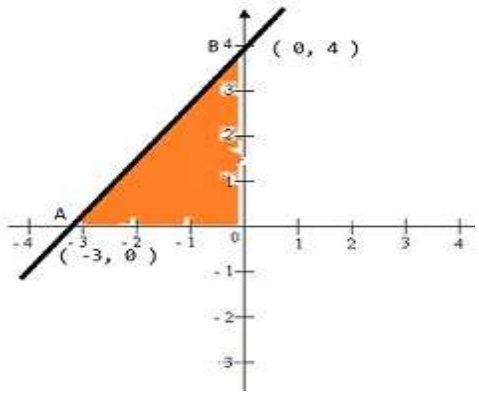
3. Find the sum of the zeroes of the polynomial $2x^2 - 8x + 6$

4. Find the point of intersection if $x + y = 6$ and $x - y = 4$.

5. In an AP the 3rd term is 5 and 7th term is 9 then what is the common difference.

6. If the Total Surface Area of a cube is 54 cm^2 what is its side.

7. Find the area of the shaded Triangle, in the figure given below

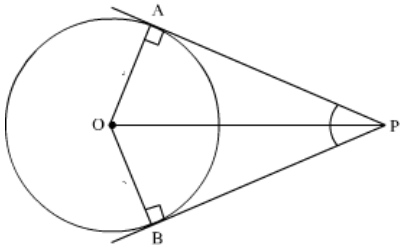


8. Δ ABC ~ Δ DEF, BC = 4 cm, EF = 5 cm and Δ ABC = 80 cm^2 then Δ DEF = ( )

a) 100 cm^2 b) 150 cm^2

c) 125 cm^2 d) 225 cm^2

9. In the figure $\angle APB = 60^0$ and OP = 10 cm, then PA =



10. Express tan θ in terms of cosec θ.

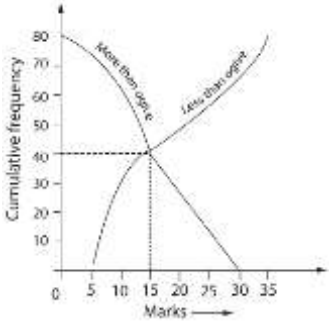
11. Write the name of the events which satisfies both the conditions given below ( )

Statement (A) : Tossing a Coin

Statement (B) : Getting a Tail or Head

a) Equally likely b) Unlikely c) More likely d) less likely

12. What is the median from the Graph.



Section - II

Note :

1. **Answer all the Questions.**
2. **Each Question carries 2 Marks. 8 × 2m = 16m**

13. Write the logarithmic form for i) $12^2 = 144$. Ii) $5^4 = 625$

14. Represent (x – 2) (3x + 5) = 2x (x – 4) is a form of quadratic equation.

15. For what value of ' k ', the pair of equations 3x + 4y + 2 = 0 and 9x + 12y + k = 0 represent coincident lines

16. A solid metallic ball of volumes $64cm^3$ is melted and made into a solid cube. Find the side of solid cube.

17. If A and B are the points (−2, 3) and (−3, 5) respectively, then find the distance 2AB.

18. It is given that Δ ABC ~ Δ DEF. Is it true to say that $\frac{BC}{CD} = \frac{AB}{EF}$. Justify your answer.

19. A person from the top of a building of height 25m has observed another building's top and bottom at an angle of elevation of 45^0 and at an angle of depression 60^0 respectively. Draw a diagram for this data.

20. The following observations are arranged in ascending order :

20, 23, 42, 53, x, x + 2, 70, 75, 82, 96. If the median is 63, find the value of x.

Section - III

Note :

1. **Answer all the Questions.**
2. **Each Question carries 4 Marks. 8 × 4m = 32m**

21. Given A = { x: x is an even number less than 10 }

B = { x: x is a prime number less than 10 } Find A ∩ B

22. If the α, β are the zeroes of $p(x) = 5x^2 + 6x + 1$ then find $\frac{1}{\alpha} + \frac{1}{\beta}$

23. Find the roots of the equation $5x^2 - 6x - 2 = 0$ by the method of completing the square.

24. The number of terms in the AP: 18, $15\frac{1}{2}$, 13, ……. -47 are 27. Justify.

25. Prove that "the lengths of tangents drawn from an external point to a circle are equal" by using Pythagoras Theorem.

26. Prove that $\sqrt{\frac{1+\sin A}{1-\sin A}}$ = sec A + tan A, (where A is acute)

27. A tower stands vertically on the ground. From a point which is15 meters away from the foot of the tower, the angle of elevation of the top of the tower is 45^0. What is the height of the tower?

28. A piggy bank contains hundred 50p coins, fifty Rs. I coins, twenty Rs. 2 coins and Rs. 5 coins. If it is equally likely that one of the coins will fall out the bank is turned upside down, find the probability that the coin which fell will be more than Rs.1.

Section - IV

Note :

1. **Answer all the Questions.**
2. **Each Question carries 8 Marks.**
3. **There is internal choice for each questions** **5 × 8m = 40m**

29. Prove that $\sqrt{2}$ + $3\sqrt{5}$ is an irrational number.

Also check whether $(\sqrt{2} + 3\sqrt{5})(\sqrt{2} - 3\sqrt{5})$ is rational or Irrational.

(or)

A rectangular park is to be designed whole breadth is 3m less than its length. Its area is to be 4 square meters more than the area of park , that has already been made in the shape of isosceles triangles with its base as the breadth of the rectangular park and altitude 12. Find the length and breadth.

30. Three metallic spheres of radii 6 cm, 8cm and 10cm respectively are melted together to form a single solid sphere. Find the radius of the resulting sphere.

(or)

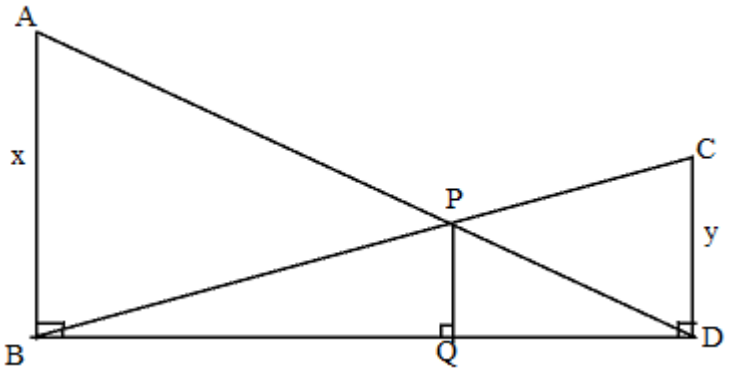
If the Geometric Progression 162, 54, 18, … and $\frac{2}{81}$, $\frac{2}{27}$, $\frac{2}{9}$, …. Have their n^{th} terms equal, then find the value of ' n '.

31. Find the area of the Triangle formed by joining the mid-points of the sides of the Triangle whose vertices are (0, -1), (2, 1) and (0, 3). Find the ratio of this area to the area of the given Triangle.

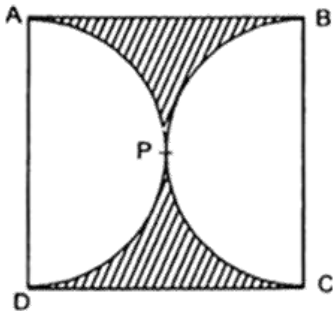
(or)

If AB, CD, PQ are perpendicular to BD. AB = x; CD = y and PQ = z Prove that

$$\frac{1}{x} + \frac{1}{y} = \frac{1}{z}$$



32. Find the area of the shaded region in the following figure, if ABCD is square of side 7 cm and APD and BPC are semi circles. (Take π = $\frac{22}{7}$).



(or)

100 surnames were randomly picked up from a local telephone directory and the frequency distribution of the number of letters in the English alphabet in the surnames was obtained as follows:

Number of letters	1 - 4	4 - 7	7 - 10	10 - 13	13 - 16	16 - 19
Number of Surnames	6	30	40	16	4	4

Determine the median number of letters in the surnames. Find the mean number of letters in the surnames? Also The Modal size of the Surnames.

33. i) Draw the graph of $y = x^2 - x + 9$ and find zeroes.

ii) Solve the equations by graphically $3x + 4y = 10$ and $4x - 3y = 5$

(or)

i) Draw a circle with radius 5 cm and construct a pair of tangents from a point 8 cm away from the centre. Measure the length of the Tangent.

ii) The following data indicates marks of 53 students in a set.

Marks	00 - 10	10 - 20	20 - 30	30 - 40	40 - 50	50 - 60	60 - 70	70 - 80
Number of Students	5	3	4	3	4	7	9	7

Draw a " Less Than Ogive curve " for the data