

Roll No. 2316053

F-3-X

Total No. of Questions : 20] [Total No. of Printed Pages : 7 + Graph

SSERJSZM17

12503-X

MATHEMATICS

Time : 3 Hours]

[Maximum Marks : 100

Note :- (i) All questions are compulsory.

(ii) Diagrams, whenever necessary should be neat and accurate.

1. Fill in the blanks :

(i) The H. C. F. of 510 and 92 is 4 1

(ii) The 10th term of the A. P. 2, 7, 12 is 47 1

(iii) The zero's of polynomial $x^2 - 9$ are 3, -3 1

(iv) The bisector of 90° angle is 45° 1

(v) The circumference of a circle is $2\pi r$ 1

(vi) Probability of a sure event is 1 1

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Turn Over

2. Find the distance between the points $(-5, 7)$ and $(-1, 3)$. 2

3. TP and TQ are the tangents to a circle with centre O, so that $\angle POQ = 110^\circ$. Find angle PTQ. 2

4. If $\sec 4A = \operatorname{cosec}(A-20)$, where $4A$ is an acute angle, find the value of A . 2

5. Use Euclid's division algorithm to find the H. C. F of 867 and 255. 4

6. Find the 31st term of an A. P. whose 11th term is 38 and 16th term is 73. 4

7. Solve the linear equation by the cross-multiplication method :
$$x - 3y = 7$$
$$3x - 3y = 15$$
 4

8. Five years ago, Nuri was thrice as old as Sonu. Ten years later Nuri will be twice as old as Sonu. How old are Nuri and Sonu ? 4

9. Divide $2t^4 + 3t^3 - 2t^2 - 9t - 12$ by $t^2 - 3$. 4

10. A bag contains lemon flavoured candies only. Sara takes out one candy without looking into the bag. What is the probability that she takes out :

4

(i) an orange flavoured candy

(ii) a lemon flavoured candy ?

4

11. Find the roots of the quadratic equation $2x^2 - 7x + 3 = 0$, if they exist by the method of quadratic formula.

4

Or

Sum of the areas of two squares is 468 m^2 . If the difference of their perimeters is 24 m, find the sides of the two squares.

6

12. Find the roots of $2x^2 - x + \frac{1}{8} = 0$ by the method of factorisation.

Or

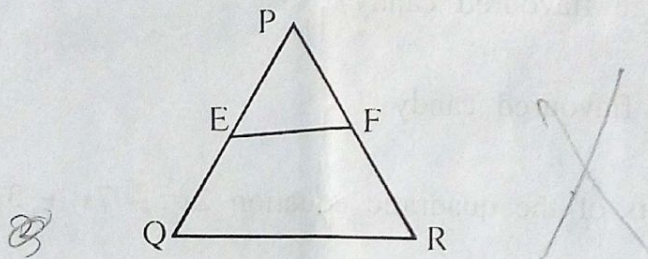
The product of two consecutive positive integers is 306. Find the integers.

4

6

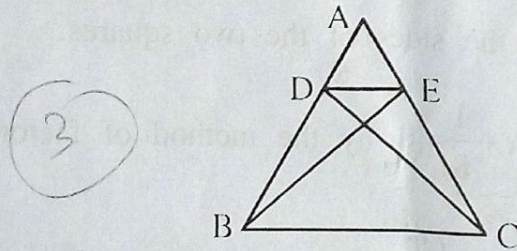
(4)

13. E and F are points on the sides PQ and PR respectively of ΔPQR where $PE = 3.9$ cm, $EQ = 3$ cm, $PF = 3.6$ cm and $FR = 2.4$ cm. Prove that $EF \parallel QR$.



Or

In figure, if $\Delta ABE \cong \Delta ACD$, show that $\Delta ADE \sim \Delta ABC$.



14. Diagonals of a trapezium ABCD with $AB \parallel DC$ intersect each other at the point O. If $AB = 2 CD$, find the ratio of the areas of triangles AOB and COD.

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(5)

5

Or

ABC is an equilateral triangle of side $2a$. Find its altitude. 6

15. Find the area of a triangle formed by the points A (2, 3), B (-1, 0) and C(2, -4).

4

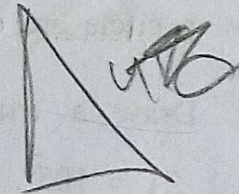
Or

Find the co-ordinates of a point A, where AB is the diameter of a circle whose centre is (2, -3) and B is (1, 4). 6

16. If $\sin A = 3/4$, calculate $\cos A$ and $\tan A$.

5

Or



Prove that identity :

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

6

17. The shadow of a tower standing on a level ground is found to be 40 m longer, when the sun's altitude is 30° than when it is 60° .

6

Find the height of the tower.

Or

Evaluate :

(i) $\frac{\sin^2 63^\circ + \sin^2 27^\circ}{\cos^2 17^\circ + \cos^2 73^\circ}$

(ii) $\sin 25^\circ \cos 65^\circ + \cos 25^\circ \sin 65^\circ$

7

18. Two concentric circles are of radii 5 cm and 3 cm. Find the length of the chord of the larger circle, which touches smaller circle.

Or

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

7

19. Draw a triangle ABC with side BC = 7 cm, $\angle B = 45^\circ$, $\angle A = 105^\circ$. Then construct a triangle whose sides are $\frac{4}{3}$ times the corresponding sides of a ΔABC . (Write the steps of construction.)

Or

Draw a circle of radius 6 cm. From a point 10 cm away from the centre, construct the pair of tangents to the circle and measure their lengths. (Write the steps of construction.)

7

(7)

20. A toy is in the form of a cone of radius 3.5 cm mounted on a hemisphere of same radius. The total height of the toy is 15.5 cm. Find the total surface area of the toy.

Or

A cap is shaped like the frustum of a cone. If its radius on the open side is 10 cm radius at the upper base is 4 cm and its slant height is 15 cm. Find the area of material used for making it.

7

6