F–3–Y

Roll No. .....

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

SSERJSZM17
12503-Y
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 L. C. M. of 12, 15 and 21 is 1

(ii) The 5th term of the A. P. 2, 7, 12 ..... is 1

(iii) In a quadratic equation $ax^2 + bx + c = 0$ $a \neq 0$ the product of the roots is 1

(iv) The right bisector of a line divides it into ..... equal parts. 1

(v) The area of a square whose side is 3 cm is 1

(vi) Probability of an impossible event is 1

2. Find the distance between the points (36, 15) and (0, 0).

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

4. If $\tan 2A = \cot (A - 18°)$, find the value of A, where 2 A is an acute angle.

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

6. If the 3rd and the 9th terms of an A. P. are 4 and –8 respectively, which term of this A. P. is zero ?

7. Solve the linear equation by the cross-multiplication method :

$$2x + y = 5$$

$$3x + 2y = 8$$

8. If we add 1 to the numerator and subtract 1 from the denominator, a fraction reduces to 1. It becomes 1/2, if we only add 1 to the denominator. What is the fraction ?

9. Find a quadratic polynomial, as the sum and product of its zero's is 0 and $\sqrt{5}$ respectively.

10. A card is drawn from a pack of 52 cards. What is the probability of getting :

(i) Jack

(ii) The ace of spades ? (4)

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

Or

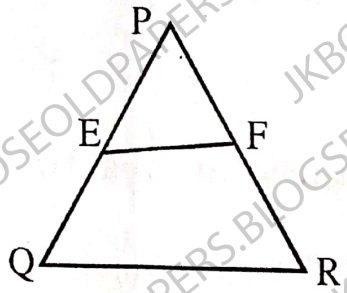
Sum of the areas of two squares is 468 m^2. If the difference of their perimeters is 24 m, find the sides of the two squares. (6)

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

Or

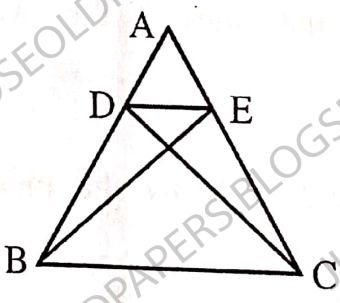
The product of two consecutive positive integers is 306. Find the integers. (6)

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 $\Delta ADE \sim \Delta ABC$.



5 6

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

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).

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.

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°. Find the height of the tower.

Or

Evaluate :

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

(ii) $\sin 25° \cos 65° + \cos 25° \sin 65°$ 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, $\angle B = 45°$, $\angle A = 105°$. 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

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)