

SWO International Mathematics Olympiad 2021-22

Class 10th

Questions: 20

Time Duration: 30 Minutes

There are 4 Sections- 5 Questions in Section-1, 5 Questions in Section-2, 5 Questions in Section-3, 5 Questions in Section-4.

Section 1- (Euclid's method, Polynomials and Linear Equations)

1. Use Euclid's division algorithm and find the HCF of 867 and 255.

- a. 50
- b. 51
- c. 52
- d. 53

(b)

2. If one root of the polynomial $p(y) = 5y^2 + 13y + m$ is reciprocal of other, then find the value of 'm'?

- a. 5
- b. 4
- c. 3
- d. 2

(a)

3. If both the zeroes of the quadratic polynomial $ax^2 + bx + c$ are equal and opposite in sign, then find the value of 'b'?

- a. 0
- b. 1
- c. 2
- d. 3

(a)

4. If 1 is added to each of the given two numbers, then their ratio is 1:2. If 5 is subtracted from each of the numbers, then their ratio is 5:11. Find the numbers.

- a. 35, 70
- b. 35, 71
- c. 35, 72
- d. 35, 73

(b)

5. It can take 12 hours to fill a swimming pool using 2 pipes. If the larger diameter pipe is used for 4 hours & the smaller diameter for 9 hours, only $\frac{1}{2}$ of the pool can be filled in one go. How long would it take to fill the pool using the two pipes?

- a. 10 hours, 20 hours
- b. 20 hours, 30 hours
- c. 30 hours, 40 hours
- d. 40 hours, 50 hours

(b)

Section 2- (Quadratic Equations and Arithmetic Progressions)

6. Which of the following is not a quadratic equation?

- (a) $x^2 + 3x - 5 = 0$
- (b) $x^2 + x^3 + 2 = 0$
- (c) $3 + x + x^2 = 0$
- (d) $x^2 - 9 = 0$

(b)

7. The quadratic equation has degree

- (a) 0
- (b) 1
- (c) 2
- (d) 3

(c)

8. The cubic equation has degree

- (a) 1
- (b) 2
- (c) 3
- (d) 4

(c)

9. The n th term of an A.P. is given by $a_n = 3 + 4n$. The common difference is

- (a) 7
- (b) 3
- (c) 4
- (d) 1

(c)

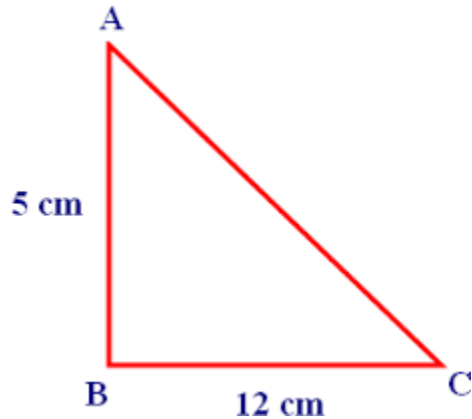
10. If p, q, r and s are in A.P. then $r - q$ is

- (a) $s - p$
- (b) $s - q$

- (c) $s - r$
 (d) none of these (c)

Section 3- (Triangles, quadratic equations, trigonometry)

11. In the given right angle Triangle, Find the hypotenuse.



- a. 13 cm
 b. 12 cm
 c. 11 cm
 d. 10 cm (a)

12. If the points $P(1, 2)$, $B(0, 0)$ and $C(a, b)$ are collinear, then

- (a) $2a = b$
 (b) $a = -b$
 (c) $a = 2b$
 (d) $a = b$ (a)

13. The area of the triangle formed by the points $A(-1.5, 3)$, $B(6, -2)$ and $C(-3, 4)$ is

- (a) 0
 (b) 1
 (c) 2
 (d) $3/2$ (a)

14. If $\sin A - \cos A = 0$, then the value of $\sin^4 A + \cos^4 A$ is

- (a) 2
 (b) 1
 (c) $3/4$
 (d) $1/2$ (d)

15. If in $\triangle ABC$, $\angle C = 90^\circ$, then $\sin (A + B) =$
- (a) 0
 - (b) $1/2$
 - (c) $12\sqrt{\quad}$
 - (d) 1

Section 4- (Circles, Surface Areas & Volumes, Probability)

16. The distance between two parallel tangents of a circle is 18 cm, then the radius of the circle is

- (a) 8 cm
- (b) 10 cm
- (c) 9 cm
- (d) 7.5 cm

17. Out of the two concentric circles, the radius of the outer circle is 5 cm and the chord AC of length 8 cm is a tangent to the inner circle. The radius of the inner circle will be

- (a) 3 cm
- (b) 4 cm
- (c) 2.5 cm
- (d) 2 cm

18. A mason constructs a wall of dimensions $270\text{cm} \times 300\text{cm} \times 350\text{cm}$ with the bricks each of size $22.5\text{cm} \times 11.25\text{cm} \times 8.75\text{cm}$ and it is assumed that $1/8$ space is covered by the mortar. Then the number of bricks used to construct the wall is:

- (A) 11100
- (B) 11200
- (C) 11000
- (D) 11300

19. Volumes of two spheres are in the ratio 64:27. The ratio of their surface areas is:

(A) 3 : 4

(B) 4 : 3

(C) 9 : 16

(D) 16 : 9

(d)

20. A school has five houses A, B, C, D and E. A class has 23 students, 4 from house A, 8 from house B, 5 from house C, 2 from house D and rest from house E. A single student is selected at random to be the class monitor. The probability that the selected student is not from A, B and C is:

(a) $\frac{4}{23}$

(b) $\frac{6}{23}$

(c) $\frac{8}{23}$

(d) $\frac{17}{23}$

(b)