

Practice Set 3

A Whole Content Based Test for Class 10th Mathematics Olympiad

1. Pick the odd one out.

- a Mode = 2 Mean - 2 Median
- b Mode = 2 Median - 3 Mean
- c Mode = 3 Median - 2 Mean
- d Mode = 3 Median + 2 Mean

2. The number 222 222 222 222 is divisible by

- a 4 and 11
- b 9 and 11
- c 3 and 11
- d Only 11

3. Sum of digits of a two-digit number is 6 and product is 5 (if $x > y$), then the number formed by interchanging the digits, is

- a 15
- b 51
- c 23
- d 32

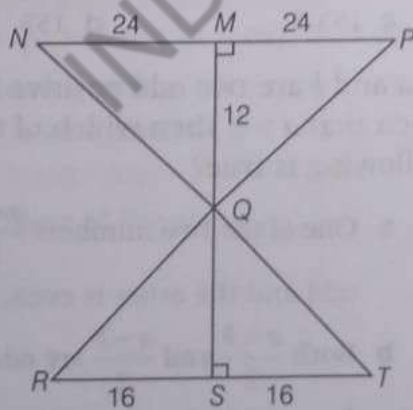
4. If the n th term of an AP is $(4n + 1)$, then sum of first n terms is

- a $n(n + 1)$
- b $n(2n + 1)$
- c $n(n + 3)$
- d $n(2n + 3)$

5. The line joining the points $A(3, -5)$ and $B(3, 5)$ is divided by C such that $AC : CB = 2 : 5$, then coordinates of point C are

- a $(-1, 3)$
- b $(1, 3)$
- c $(3, 1)$
- d $(3, -1)$

6. Find the length of the altitude QS .



- a 4
- b 8
- c 12
- d 16

7. If the common tangents AB and CD of two circles with centres O and O' intersect at E , then which of the following is true?

- a O, E, O' form a triangle.
- b A, B, O, O' form a square.
- c O, E, O' are collinear.
- d A, B, O, O' are collinear.

8. Two classes were given a Science test. The first class had 25 students and the average test score was 66%. The second class had 15 students and their average score was 94%. If the teacher combined the test scores of both classes, what is the average of both classes together?

- a 88%
- b 88.5%
- c 89%
- d 90%

9. If a coin is tossed three times in succession, then the number of sample points in sample space is

- a 8
- b 3
- c 6
- d 9

10. If LCM of two numbers is 48, then which of the following cannot be their HCF?

- a 9
- b 8
- c 6
- d 3

11. On dividing $x^4 - 5x + 6$ by a polynomial $g(x)$, the quotient and remainder were $-x^2 - 2$ and $-5x + 10$ respectively, then $g(x)$ is

- a $x^2 - 2$
- b $2 - x^2$
- c $(x^2 + 2)$
- d $-(x^2 + 2)$

12. Two cars are 480 miles apart and moving directly towards each other to meet at a resort built on the way. One car moving at a speed of 100 mile/h and other is moving at 70 mile/h. If car moving in high speed reaches the resort two hours before the other car. Then, distance covered by slower car is

- a 200 miles
- b 240 miles
- c 280 miles
- d 320 miles

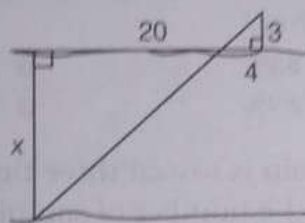
13. Assertion (A) If the roots of the equation $ax^2 - 2\sqrt{2}x + c$ are real and equal, then $ac = \frac{1}{2}$.

Reason (R) If the discriminant of a quadratic equation is zero, then roots are real and equal.

Which of the following statements is true?

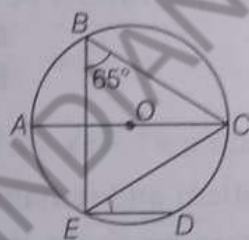
- a (A) is true and (R) is correct explanation of (A)
 b (A) is false and (R) is true
 c (A) is true and (R) is false
 d Both (A) and (R) are false
14. If points $A(-3, 0)$, $B(x, -3)$ and $C(4, 1)$ are the vertices of an isosceles right angle triangle with AC as the hypotenuse, then the area of the triangle is
- a $\frac{25}{2}$ sq units b 25 sq units
 c 50 sq units d $\sqrt{50}$ sq units

15. Ruchi wanted to find the distance across a stream. She measured and made the diagram given below. What is the distance across the stream?



- a 25 b 20 c 15 d 10

16. In the below figure, chord ED is parallel to the diameter AC of the circle. If $\angle CBE = 65^\circ$, then what is the value of $\angle DEC$?



- a 35° b 25° c 45° d 55°

17. An integer is chosen at random from first 200 natural numbers. What is the probability that the integer is divisible by both 6 and 8?

- a $1/20$ b $1/25$
 c $1/18$ d $1/15$

18. The least number which should be subtracted from 0.000326 to make it a perfect square is

- a 0.0002 b 0.00002
 c 0.000002 d 0.02

19. If α and β are the zeroes of the quadratic polynomial $g(x) = 2x^2 + 5x + k$ such that $\alpha^2 + \beta^2 + \alpha\beta = \frac{21}{4}$, then the value of k is

- a 2 b 4
 c -2 d -4

20. The relation obtained by eliminating θ from the equation $x = r \cos \theta + s \sin \theta$ and $y = r \sin \theta - s \cos \theta$ will be

- a $x^2 + y^2 = 0$ b $x^2 + y^2 = r^2 + s^2$
 c $x^2 + y^2 = r^2$ d $x^2 + y^2 = s^2$

21. If the difference of the roots of the quadratic equation $x^2 + kx + 4 = 0$ is 3, then the positive value of k is

- a -5 b 5 c -4 d 4

22. The sum of the 6th and 14th terms of an arithmetic progression is 20. What is the sum of the first 19th sum of the arithmetic progression?

- a 200 b 190
 c 180 d None of these

23. If A , B and C are interior angles of a ΔABC , then which of the following is true?

a $\sin\left(\frac{B+C}{2}\right) = \cos\frac{A}{2}$

b $\sin\left(\frac{A+B}{2}\right) = \cos\frac{A}{2}$

c $\cos\left(\frac{A+C}{2}\right) = 90^\circ$

- d None of the above

24. The median of the following information is

Height	151	152	153	154	155	156	157
Number of plants	6	4	11	9	16	12	2

- a 154.5 b 155.5
 c 153.5 d 153

25. If a and b are two odd positive integers such that $a > b$, then which of the following is true?

- a One of the two numbers $\frac{a+b}{2}$ and $\frac{a-b}{2}$ is odd and the other is even.

- b Both $\frac{a+b}{2}$ and $\frac{a-b}{2}$ are odd.

- c Both $\frac{a+b}{2}$ and $\frac{a-b}{2}$ are even.

- d Can't be determined

26. The point $P(4, 3)$ is reflected in the X -axis as $P'(x, y)$ and O' is the image of O (the origin) when reflected in the line PP' . Then, find the perimeter of quadrilateral $POP'O'$.

- a 10 units
b 5 units
c 20 units
d 7 units

27. Global Tea Estate began production in 1999, it produced 8000 cartons of tea, it is projected that production will increase by 50 cartons each year. Also, the production cost for first year was ₹ 70 per carton which reduced by ₹ 2 each successive year and the selling price of each carton increases by 10% of the production cost of year 1999.

The production in the 5th year is

- a 8000 b 8200
c 8400 d 8600

28. A circular pond is to be constructed inside a circular park having origin as the centre such that the circumference of the pond passes through the point $(5, 2\sqrt{6})$ and the remaining area of the park is 462 units, then which of the following point lies on the circumference of the park?

- a $(10, 4\sqrt{6})$ b $(15, 6\sqrt{6})$
c $(5, 4\sqrt{6})$ d $(10, 2\sqrt{6})$

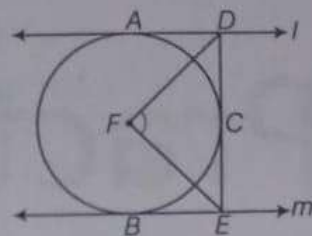
29. The value of $\log \cos 0^\circ + \log \cos 1^\circ + \log \cos 2^\circ + \dots + \log \cos 90^\circ$ is

- a 0
b 1
c -1
d Undefined

30. $\sqrt{-4 + \sqrt{8 + 16 \sec^4 \alpha + \cos^4 \alpha}}$ is equal to

- a $\sec \alpha - \cos \alpha$
b $2 \sec \alpha + \cos \alpha$
c $2 \sec \alpha - \cos \alpha$
d None of the above

31. In the given figure, l and m are two parallel tangents at A and B . If the tangent at C makes an intercept DE between the tangents l and m . Then, $\angle DFE$ is equal to



- a 90° b 60° c 75° d 45°

32. Two bus stands due East of a leaning pole which lean towards the West at a distance of m and n from its foot. If α and β are the elevation of the top of the pole from these stands, then its inclination θ to the horizontal is given by $\cot \theta$ is equal to

- a $\frac{n \cot \alpha - m \cot \beta}{n - m}$ b $\frac{m \cot \alpha - n \cot \beta}{n - m}$
c $\frac{n \cot \alpha - m \cot \beta}{m - n}$ d $\frac{m \cot \alpha - n \cot \beta}{m - n}$

33. Solve the following and choose the correct option.

$$x \left(a - b + \frac{ab}{a - b} \right) = y \left(a + b - \frac{ab}{a + b} \right)$$

$$x + y = 2a^2$$

- a $x = \frac{a^3 - b^3}{a}, y = \frac{a^2 - b^2}{b}$
b $x = \frac{a^2 - b^2}{a}, y = \frac{a^2 - b^2}{b}$
c $x = \frac{a^3 - b^3}{a}, y = \frac{a^3 + b^3}{a}$
d None of the above

34. In a class in which all students practice atleast one sport, 60% of students play soccer or basketball and 10% practice both sports. If there is also 60% that do not play soccer, then the probability that a student chosen at random from the class play soccer only, is

- a 0.1 b 0.2 c 0.3 d 0.4

35. Points $(3, 0)$ and $(-1, 0)$ are invariant points under reflection in the line L_1 . Points $(0, -3)$ and $(0, 1)$ are invariant points on reflection in line L_2 . Then, the lines L_1 and L_2 are respectively

- a X -axis, Y -axis b Y -axis, X -axis
c $y = x$, origin d origin, $y = x$

Answers

- | | | | | | | | | | |
|-------|-------|-------|-------|-------|-------|-------|-------|-------|-------|
| 1. c | 2. c | 3. a | 4. d | 5. d | 6. b | 7. c | 8. c | 9. a | 10. a |
| 11. b | 12. c | 13. b | 14. a | 15. c | 16. b | 17. b | 18. c | 19. a | 20. b |
| 21. b | 22. b | 23. a | 24. a | 25. a | 26. c | 27. b | 28. a | 29. d | 30. c |
| 31. a | 32. a | 33. c | 34. c | 35. a | | | | | |