

ESSENCE TEST-12

DATE : 01-09-19

10TH CLASS

CBSE(B1)

QUADRATIC EQUATION, CO-ORNATE GEOMETRY,
ARITHMETIC PROGRESSION, LINEAR EQUATION

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MARKS : 80**MATHEMATICS**
SECTION – (A)**TIME : 3 :00 HR.**

1. If the distance between the points $(p, 4)$ and $(0, 1)$ is 5, then the value of p is **[1]**
(a) 4 only (b) ± 4 (c) -4 only (d) 0
2. Aruna has only Rs. 1 and Rs. 2 coins with her. If the total number of coins that she has is 50 and the amount of money with her is Rs. 75, then the number Rs. 1 and Rs. 2 coins are respectively. **[1]**
(a) 35 and 15 (b) 25 and 25 (c) 15 and 35 (d) 30 and 25
3. A fast train takes 2 hours less for a journey of 300 km in comparison to a slow train whose speed is 5 km/h less than that of the fast train. The speed of the fast train is equal to **[1]**
(a) 25 km/h (b) 30 km/h (c) 40 km/h (d) 45 km/h
4. If the n th term of a sequence is $3 + 2n$, then the sum of its first 20 terms is **[1]**
(a) 480 (b) 520 (c) 500 (d) 460

SECTION – (B)

5. Find the solution of the pair of linear equation $37x + 43y = 123$, $43x + 37y = 117$. **[2]**
6. Solve for x : $p^2 x^2 + (p^2 - q^2)x - q^2 = 0$, $p \neq 0$. **[2]**
7. Find the sum of first 25 terms of an AP whose n th term is $1 - 4n$. **[2]**

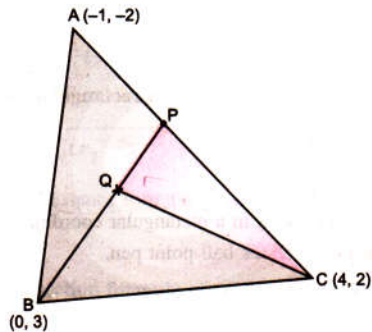
SECTION – (C)

8. If P (x, y) is any point on the line joining the points A (a, 0) and B (0, b), then show that $\frac{x}{a} + \frac{y}{b} = 1$. [3]
9. Show that the points A (5, 6), B (1, 5), C (2, 1) and D (6, 2) are the vertices of a square. [3]
10. The point R divides the line segment AB such that $AR = \frac{3}{4} AB$. Find the coordinates of R if the points A and B are respectively (-4, 0) and (0, 6). [3]
11. By the method of factorization, find the roots of the quadratic equation $\sqrt{\frac{a}{b}}x^2 + \left(\sqrt{a} - \frac{2}{\sqrt{b}}\right)x - 2 = 0$, where $a > 0, b > 0$. [3]
12. Solve the quadratic equation $a^2u^2 + 2abcdu - (1 + 2c)(b^2d^2) = 0$ by completing the perfect square. [3]
13. A motor boat whose speed is 18 km/hour in still water takes 1 hour more to go 24 km upstream than to return downstream to the same spot. Find the speed of the stream. [3]
14. Solve the following system of equations $\frac{bx}{a} - \frac{ay}{b} + a + b = 0, bx - ay + 2ab = 0$
15. A two-digit number is such that the product of its digits is 35. When 18 is added to the number, the digits interchange their places. Find the number. [3]

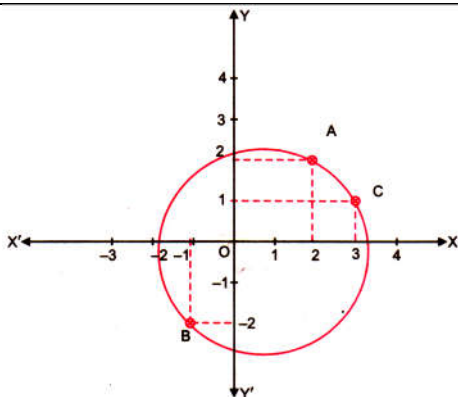
16. Find the value(s) of k for which the pair of linear equation $kx + 3y = k - 2$ and $12x + ky = k$ has no solution. [3]
17. If 9th term of an AP is 37 and 17th term is 47, find the sum of first 29 terms of the AP. [3]

SECTION – (D)

18. In figure, P divides AC in the ratio 1 : 2 and Q divides BP in the ratio 3 : 1. Find the area of the ΔBQC and the area of the ΔPQC .



19. A passenger train takes $1\frac{2}{3}$ hours less for a journey of 400 km if its speed is increased by 8 km/hour from its original speed. Find the original speed of the train. [4]
20. In figure, find the coordinates of the centre of the circle which is drawn through the points A, B and C. Also find the radius. [4]



21. The difference of two positive integers is 4 and the numerical difference of their reciprocals is $\frac{1}{24}$. Find the integers.
22. Two points A and B on a highway are at a distance of 240 km from each other. The car which starts from A moves with constant speed along the direction AB and the second car moves from B at the same time with a constant speed in the same direction. The first car overtakes the second in 4 hours. However, if the second car moves from B towards A, the two cars meet each other after two hours. Find the speed of the car which starts from B. [4]
23. The sum of the ages of a man and his son is 59 years. Three years hence, the numerical product of their ages will be 750. Find their present ages. [4]
24. If the m th term of an AP is $\frac{1}{n}$ and the n th term is $\frac{1}{m}$, then show that the (mn) th term of the AP is 1. ($m \neq n$). [4]

25. The sum of three natural numbers in AP is 15, the common difference of the AP is also a natural number and the product of the numbers is 105.

Find the numbers.

[4]

26. If the pth term of an AP is a and qth term is b, then show that the sum of

its p + q terms is $\frac{p+q}{2} \left\{ a+b + \frac{a-b}{p-q} \right\}$ [4]

27. The ratio of the sums to n terms of two Ap's is $(7n + 1) : (4n + 27)$. Find the

ratio of their 9th terms.

[4]



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