1. In a triangle ABC, X is a point on AC such that \( \frac{AX}{XC} = 3 \) and \( \angle AXB = 70^\circ \). Find the length of AC is \( \angle ABC = 110^\circ \) and BC = 6cm.
   (a) 18 cm  (b) 12 cm  (c) 10 cm  (d) 8 cm

2. Each small circle in the figure has radius 1. The innermost circle is tangent to six circles that surround it, and each of those circles is tangent to the large circle and to its small circle neighbours. Find the area of the shaded portion.
   (a) \( \pi \)  (b) 1.5 \( \pi \)  (c) 2 \( \pi \)  (d) 3.5 \( \pi \)

3. Complete the magic pentagon by putting numbers in circles where A, B, C, D and E are shown, so that the sum of the three numbers along each of the sides of the pentagon equals 100. What is the sum of the values of A, B, C, D and E.
   (a) 200  (b) 150  (c) 195  (d) 167

4. How many three digit numbers N can be there such that \( N - 14 \) is divisible by 7, \( N - 24 \) is divisible by 8 and \( N - 36 \) is divisible by 9.
   (a) 5  (b) 3  (c) 1  (d) None of these

5. If \( 2^x = 8^{y+1} \) and \( 9^y = 3^{x-9} \) then find the value of \( x + y \).
   (a) 27  (b) 9  (c) 21  (d) 19

6. In a math class, each student’s final grade is the average of the scores on ‘N’ tests. If A mar scores a 97 on the last test, his grade will be exactly 90. If he scores 73 on the last test, his grade will be exactly 87. What is the value of ‘N’?
   (a) 10  (b) 9  (c) 7  (d) 8

7. Given that the ratio of 3x – 4 to y + 15 is constant and y = 3 when x = 2, then find x, when y = 12.
   (a) \( \frac{1}{8} \)  (b) \( \frac{7}{3} \)  (c) \( \frac{7}{8} \)  (d) 8
8. The length of the common chord of two intersecting circles is 16 feet. If the radii of the two circles are 10 feet and 17 feet, then the distance between the centers of the two circles is
(a) 27 ft.  (b) 21 ft.  (c) $\sqrt{389}$ ft.  (d) cannot be determined

9. The sum of two number is 1 and their product is 1, then the sum of their cubes is :
(a) 2  (b) 0  (c) $\frac{-3i\sqrt{3}}{4}$  (d) $-2$

10. Simplify : $\sqrt{\frac{8^{10} + 4^{10}}{8^4 + 4^4}}$
(a) $\sqrt{2}$  (b) 32  (c) 16  (d) $12^{2/3}$

11. The solution of the equation : $\frac{x + 4}{4} + \frac{y + 3}{5} = 2$ and $\frac{2x + 1}{3} - \frac{y + 5}{2} = 2$ is
(a) $x = 4, y = 3$  (b) $x = 4, y = -3$  (c) $x = -4, y = -3$  (d) $x = -4, y = 3$

12. When $(x^4 - 3x^3 + 2x^2 - 5x + 7)$ is divided by $(x - 2)$, the remainder is :
(a) $-3$  (b) 3  (c) 2  (d) 0

13. The shaded area in the figure represents :
(a) $A \cup (B \cup C)$  (b) $A \cap (B \cup C)$  (c) $A \cap (B \cap C)$  (d) $A \cap (B \cup C)$

14. If a solid sphere of radius ‘r’ is melted and cast into the shape of a solid cone of height ‘r’, then the radius of the base of the cone is :
(a) r  (b) 2r  (c) 4r  (d) 3r

15. Find the difference between the compound interest and simple interest of Rs. 8000 for 3 years at 5% per annum.
(a) Rs. 71  (b) Rs. 65  (c) Rs. 61  (d) Rs. 69
## Answer Key

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