APJEE
Sample Paper

MATHEMATICS

1. If $\frac{a}{b}$ is a rational number such that $a < b$, then $\frac{a}{b}$

(A) is always less than 1

(B) is always greater than 1

(C) is always equal to 1

(D) may be less or greater than 1

2. The factors of $(2x - 3y)^3 + (3y - 4z)^3 - 8(x - 2z)^3$ are

(A) $2x \times 3y \times 4z$

(B) $3(2x - 3y)(3y - 4z)(x - 2z)$

(C) $2(2x - 3y)(3y - 4z)(2z - x)$

(D) $6(2x - 3y)(3y - 4z)(2z - x)$

3. The point whose abscissa is -8 and lies in the third quadrant is

(A) $(-8, 0)$

(B) $(0, -8)$

(C) $(-8, 2)$

(D) $(-8, -3)$

4. Given five distinct points in a plane, no three of them are collinear. The number of lines that can be drawn through them is

(A) 5

(B) 10

(C) 15

(D) 20

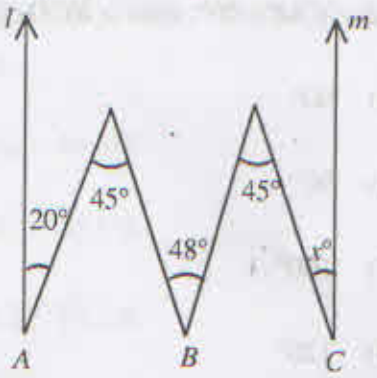
5. In the figure $l \parallel m$, then x equals

(A) 20°

(B) 22°

(C) 25°

(D) 30°



6. The lengths of diagonals of a rhombus are 24 cm and 18 cm. The length of the side of rhombus is

(A) 6 cm

(B) 9 cm

(C) 12 cm

(D) 15 cm

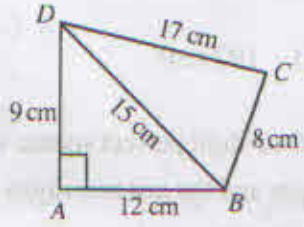
7. The area of quadrilateral $ABCD$ (as shown in figure) is

(A) 57 cm²

(B) 76 cm²

(C) 114 cm²

(D) 128 cm²



8. If the volume (in cm³) and surface area (in cm²) of a sphere are numerically equal, then the radius of the sphere is

(A) 2 cm

(B) 3 cm

(C) 3.5 cm

(D) 4 cm

9. $ABCD$ is a cyclic quadrilateral whose diagonals intersect at P. If $\angle DBC = 60°$ and $\angle CAB = 20°$, then $\angle BCD$ equals

(A) $60°$

(B) $90°$

(C) $100°$

(D) $120°$

10. If the perimeter of a rhombus is 40 cm and one of the diagonals is 16 cm, the area of the rhombus is

(A) 64 cm^2

(B) 96 cm^2

(C) 160 cm^2

(D) 192 cm^2

11. A four-digit perfect square whose first two digits and the last two digits each represent squares is

(A) 1636

(B) 1681

(C) 3664

(D) 4964

12. If α, β are the zeroes of the polynomial $x^2 - 4x - 21$, then $(\alpha + 1)(\beta + 1)$ equals

(A) 16

(B) -16

(C) 26

(D) -24

13. If $2x - 3y = 7$ and $(a + b)x - (a + b + 2)y = 4a + 2b$ represent coincident lines, then

(A) $a + b = 4$

(B) $3a + b = 0$

(C) $a + 3b = 0$

(D) $a + b = -4$

14. If $\alpha + \beta = 90°$ and $\alpha = 2\beta$, then $\cos^2\alpha + \sin^2\beta$ equals

(A) 0

(B) $\frac{1}{2}$

(C) 1

(D) 2

15. The mean of 10 observations is x. If the first term is increased by 1, the second is increased by 2, the third by 3 and so on, then the new mean is

(A) $x + 1$

(B) $x + 5$

(C) $x + 5.5$

(D) $x + 10$

16. If $2p+q$, $4q$ and $6p+q-2$ are consecutive terms of an AP and $q - p = 1$, then the values of p and q in order are

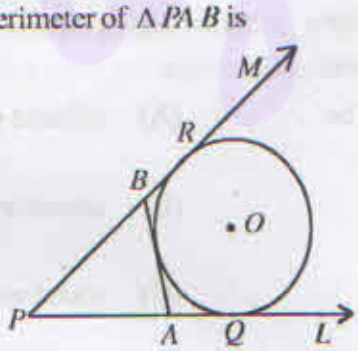
(A) 5, 4

(B) 4, 5

(C) 6, 3

(D) 3, 6

17. PQ, PR and AB are tangents to a circle with centre O and PQ = 12 cm as shown in figure. The perimeter of ΔPAB is



(A) 24 cm

(B) 25 cm

(C) 30 cm

(D) 40 cm

18. The radius of the base and the height of a right circular cylinder are each increased by 10%. The volume of the cylinder is increased by

(A) 30.4 %

(B) 40.5 %

(C) 45.2 %

(D) 33.1 %

19. One end of a diameter of a circle is (3, 4) and the centre is (–2, 3). The coordinates of the other end of the diameter is

(A) (–7, 2)

(B) (2, –7)

(C) (–3, 4)

(D) (3, –4)

20. The number of common tangents of two circles, which touch each other externally is

(A) 1

(B) 2

(C) 3

(D) 4