

APJEE

Sample Paper



MATHEMATICS

If $ab + bc + ca = 1$, then the value of

$$\frac{a+b}{1-ab} + \frac{b+c}{1-bc} + \frac{c+a}{1-ca} \text{ is}$$

(A) $(a+b)(b+c)(c+a)$

(B) abc

(C) $\frac{1}{abc}$

(D) $\frac{1}{(1-ab)(1-bc)(1-ca)}$

The value of x in $|x-2| = 12$ is

(A) 14, 10

(B) 14, -10

(C) -14, -10

(D) -14, 10

If $x = 3 + \sqrt{8}$, then $x^3 + \frac{1}{x^3}$ equals :

(A) 216

(B) 261

(C) 198

(D) 192

If the polynomials $kx^3 + 3x^2 - 13$ and $2x^3 - 5x + k$ leave the same remainder when divided by $x-2$, the value of k is

(A) 2

(B) 1

(C) 3

(D) 4

5. $8a^3 - 2a^2b - 15ab^2$ on factorisation gives

(A) $(4a+5b)(2a^2-3ab)$

(B) $(4a-5b)(2a^2-3ab)$

(C) $(4a-5b)(2a^2+3ab)$

(D) $(4a+5b)(2a^2+3ab)$

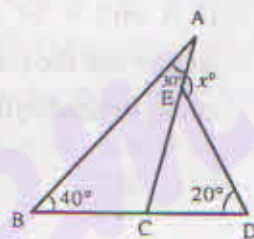
6. In the adjoining figure, the value of x is

(A) 60°

(B) 80°

(C) 70°

(D) 90°



7. In a $\triangle ABC$, if $2\angle A = 3\angle B = 6\angle C$, then $\angle A, \angle B, \angle C$ are

(A) $30^\circ, 60^\circ, 90^\circ$

(B) $90^\circ, 60^\circ, 30^\circ$

(C) $30^\circ, 90^\circ, 60^\circ$

(D) $90^\circ, 30^\circ, 60^\circ$

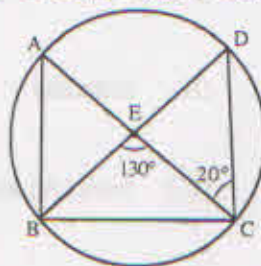
8. A, B, C and D are four concyclic points. AC and BD intersect at a point E such that $\angle BEC = 130^\circ$ and $\angle ECD = 20^\circ$, then $\angle BAC$ is

(A) 90°

(B) 100°

(C) 110°

(D) 120°



9. The diagonal of a rectangle is inclined to one side of the rectangle at 25° . The acute angle between the diagonals is

(A) 25°
(B) 40°
(C) 50°
(D) 65°

10. If A and B be the surface area of a sphere and the curved surface area of the circumscribed cylinder, then A is equal to

(A) B
(B) $2B$
(C) $\frac{1}{2}B$
(D) $\frac{2}{3}B$

11. The sum of rational and irrational number is always

(A) rational
(B) irrational
(C) both (A) and (B)
(D) can't say

12. If α, β are the roots of the quadratic equation $x^2 + ax + b = 0$, where $b \neq 0$ then the roots of the quadratic equation $bx^2 + ax + 1 = 0$ are:

(A) $\frac{\alpha}{\beta}, \frac{\beta}{\alpha}$
(B) $\frac{1}{\alpha}, \frac{1}{\beta}$
(C) α^2, β^2
(D) $\frac{1}{\alpha^2}, \frac{1}{\beta^2}$

13. If the quadratic equation $(1+m^2)x^2 + 2mcx + c^2 - a^2 = 0$ in x has equal roots, then

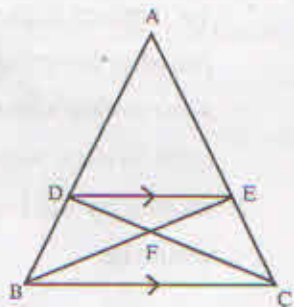
(A) $a^2 = c^2(1+m^2)$
(B) $c^2 = a^2(1+m^2)$
(C) $c^2 = a^2(1-m^2)$
(D) $a^2 = c^2(1-m^2)$

14. A three wheeler charges Rs. 10 for 1 kilometer and Rs. 5 per km subsequent. For a distance of x km, Rs. y are paid. The linear equation representing this information is

(A) $5x - y + 5 = 0$
(B) $5x - y + 10 = 0$
(C) $5x - y - 10 = 0$
(D) $10x - y + 5 = 0$

In $\triangle ABC$, $DE \parallel BC$ and $\frac{AD}{DB} = \frac{5}{4}$. The ratio between the area of $\triangle DEF$ and area of $\triangle CBF$ is

- (A) 5 : 9
- (B) 9 : 5
- (C) 25 : 81
- (D) 81 : 25



If tangents PA and PB from an external point p to q circle with centre O are inclined to each other at 80° , then $\angle POA$ is

- (A) 100°
- (B) 50°
- (C) 10°
- (D) 120°

If $\frac{\cos \alpha}{\cos \beta} = m$ and $\frac{\cos \alpha}{\sin \beta} = n$, then value of $(m^2 + n^2) \cos^2 \beta$ is :

- (A) m^2
- (B) n^2
- (C) m
- (D) n

18. A boat is being rowed away from a cliff 150 m high. The angle of elevation of the boat to the cliff changes from 60° to 45° in 1 minute. If $\sqrt{3} = 1.73$, the speed of the boat is :

- (A) 4.63 km/hr.
- (B) 4.31 km/hr.
- (C) 3.91 km/hr.
- (D) 3.81 km/hr.

19. The internal and external radii of a hollow sphere are 3 cm and 5 cm respectively. It is melted to form a solid cylinder of height $2\frac{2}{3}$ cm. The radius of base of cylinder formed is

- (A) 3.5 cm
- (B) 5.25 cm
- (C) 6.14 cm
- (D) 7 cm

20. The probability of getting 53 Thursdays in a leap year is

- (A) $\frac{1}{7}$
- (B) $\frac{2}{7}$
- (C) $\frac{3}{7}$
- (D) $\frac{1}{2}$