MATHEMATICS

Single correct answer type:

1. If the maximum value of cos(sin$x$) is a and the minimum value is b, then

   (A) $a = \cos b$

   (B) $a = b$

   (C) $b = \cos a$

   (D) $b = \sin a$

   Solution: (C)

   $-1 \le \sin x \le 1 \Rightarrow \cos 1 \le \cos(\sin x) \le 1$

   $a = 1$ and $b = \cos 1 \Rightarrow b = \cos a$

   Ideal Time: 120

   Difficulty level: 4

   Skill: Application

   Chapter Name: Trigonometric functions

   Key Concept Name: Graphs of cosx and sinx

2. If $\alpha, \beta \in R$, then the value of

   $\left|\left(4-\sin^2\alpha\right)_{max} - \left(3+\cos^2\beta\right)_{min}\right|$ is equal to

   (A) 0 (B) 1

   (C) 6 (D) 7

   Solution: (B)

   $0 \le \sin^2\alpha \le 1 \Rightarrow -1 \le -\sin^2\alpha \le 0 \Rightarrow 3 \le 4 - \sin^2\alpha \le 4$

   $0 \le \cos^2\beta \le 1 \Rightarrow 3 \le 3 + \cos^2\beta \le 4$

   $\therefore \left|\left(4-\sin^2\alpha\right)_{max} - \left(3+\cos^2\beta\right)_{min}\right| = |4-3| = 1$

   Ideal Time: 70

   Difficulty level: 3

   Skill: Evaluation

   Chapter Name: Trigonometric functions

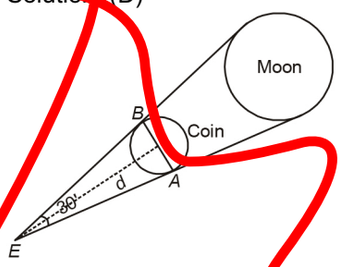
   Key Concept Name: Range of sin x and cos x

3. The approximate distance from the eye at which a coin of 2.2 cm diameter should be held so as to conceal the full moon with angular diameter 30, given that $\left(\pi = \frac{22}{7}\right)$, is equal to

   (A) 15 cm (B) 152 cm

   (C) 25 cm (D) 252 cm

   Solution: (D)

   Let d be the required distance of a coin from the eye to conceal the full moon.

   $\theta = 30' = \left(\frac{30}{60}\right)^\circ = \left(\frac{1}{2}\times\frac{\pi}{180}\right)^c$

   $= \left(\frac{\pi}{360}\right)^c$

   Let arc AB = Diameter AB of coin

   $= 2.2$ cm

   $\therefore d = \frac{s}{\theta} = \frac{2.2\times 360}{\pi}$ cm

   $= 252$ cm

   Ideal Time: 75

   Difficulty level: 3

   Skill: Evaluation

   Chapter Name: Trigonometric functions

   Key Concept Name: Basics of angles

4. If $\sec x + \sec^2 x = 1$, then value of $\tan^8 x - \tan^4 x - 2\tan^2 x =$

   (A) 1 (B) –1

   (C) 0 (D) 2

   Solution: (A)

   $\sec x = -\sec^2 x + 1 = -\tan^2 x \Rightarrow \sec^2 x = \tan^4 x$

   $1 + \tan^2 x = \tan^4 x$

   $1 + 2\tan^2 x + \tan^4 x = \tan^8 x$

   $\Rightarrow \tan^8 x - \tan^4 x - 2\tan^2 x = 1$

   Ideal Time: 120

   Difficulty level: 4

   Skill: Evaluation

   Chapter Name: Trigonometric functions

   Key Concept Name: Trigonometric identity

5. If m_1 and m_2 are minimum and maximum values of the expression $1 + 2\sin\left(\frac{\pi}{4} + \theta\right) + \cos\left(\frac{\pi}{4} + \theta\right)$ respectively. Then value of $\frac{m_2 - m_1}{m_2 + m_1}$ is

(A) 6 (B) $\sqrt{6}$

(C) 5 (D) $\sqrt{5}$

Solution: (D)

$$1 + 2\left[\frac{\sin\theta + \cos\theta}{\sqrt{2}}\right] + \left(\frac{\cos\theta - \sin\theta}{\sqrt{2}}\right)$$

$$= 1 + \left(\sqrt{2} + \frac{1}{\sqrt{2}}\right)\cos\theta + \left(\sqrt{2} - \frac{1}{\sqrt{2}}\right)\sin\theta$$

$\therefore m_1 = 1 - \sqrt{5}$ and $m_2 = 1 + \sqrt{5}$

$$\frac{m_2 - m_1}{m_2 + m_1} = \frac{\left(\sqrt{5} + 1\right) - \left(1 - \sqrt{5}\right)}{\left(\sqrt{5} + 1\right) + \left(1 - \sqrt{5}\right)} = \frac{2\sqrt{5}}{2} = \sqrt{5}$$

Ideal Time: 120

Difficulty level: 4

Skill: Evaluation

Chapter Name: Trigonometric functions

Key Concept Name: Transformation formula

6. If $\sin^2\theta = \frac{1}{2}$, then the general value of θ, is

(A) $n\pi \pm \frac{\pi}{8}; n \in Z$ (B) $n\pi \pm \frac{\pi}{6}; n \in Z$

(C) $n\pi \pm \frac{\pi}{4}; n \in Z$ (D) $n\pi \pm \frac{\pi}{3}; n \in Z$

Solution: (C)

$$\sin^2\theta = \frac{1}{2} = \left(\frac{1}{\sqrt{2}}\right)^2 = \sin^2 45^\circ = \sin^2\frac{\pi}{4}$$

$$\theta = n\pi \pm \frac{\pi}{4}$$

Ideal Time: 70

Difficulty level: 3

Skill: Rote Learning

Chapter Name: Trigonometric functions

Key Concept Name: General solution of $\sin^2 x = \sin^2\alpha$

7. The number of the solution(s) of the equation $5\sin x + 12\cos x = x^2 - 4x + 20$, is/are

(A) 3 (B) 2

(C) 1 (D) 0

Solution: (D)

R.H.S. ≥ 16

But $-13 \leq$ L.H.S. ≤ 13

$\therefore$ There is no solution.

Ideal Time: 120

Difficulty level: 4

Skill: Analysis

Chapter Name: Trigonometric functions

Key Concept Name: Range of a sinx + b cosx

8. In a triangle ABC, if $\tan\frac{B-C}{2} = \frac{5}{13}$ and $\frac{b}{c} = \frac{9}{4}$ then the value of angle A is

(A) 30° (B) 45°

(C) 60° (D) 90°

Solution: (D)

$$\tan\frac{B-C}{2} = \frac{b-c}{b+c}\cot\frac{A}{2}$$

$$\frac{5}{13} = \frac{9-4}{9+4}\cot\frac{A}{2} \Rightarrow = 1 \Rightarrow A = 90^\circ$$

Ideal Time: 120

Difficulty level: 5

Skill: Evaluation

Chapter Name: Trigonometric functions

Key Concept Name: Properties of triangle

9. In a triangle ABC, if $\frac{a+b}{c} = \cot\frac{C}{2}$, then triangle ABC must be

(A) Right angled triangle

(B) Equilateral triangle

(C) Isosceles triangle

(D) Right angled isosceles triangle

Solution: (A)

Using sine rule $\frac{\sin A + \sin B}{\sin C} = \frac{\cos\frac{C}{2}}{\sin\frac{C}{2}}$

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

$$\Rightarrow \cos\left(\frac{A-B}{2}\right) = \cos\frac{C}{2} \Rightarrow A-B = C$$

$A = B + C$

$\because A + B + C = \pi \Rightarrow 2A = 180^\circ \Rightarrow A = 90^\circ$

Ideal Time: 150

Difficulty level: 6

Skill: Evaluation

Chapter Name: Trigonometric functions

Key Concept Name: Properties of triangle

10. If solution of $12\cos^3 x - 3\cos y = a$ lies on the line $y = 3x$, then exhaustive range of a is

(A) $(-9, 9)$ (B) $[-9, 9]$

(C) $(-\infty, -9) \cup [9, \infty]$ (D) $[-3, 3]$

Solution: (B)

$12\cos^3 x - 3\cos 3x = a$

$\Rightarrow 12\cos^3 x - 3[4\cos^3 x - 3\cos x] = a$

$\Rightarrow 12\cos^3 x - 12\cos^3 x + 9\cos x = a$

$\Rightarrow 9\cos x = a \Rightarrow a \in [-9, 9]$

Ideal Time: 120

Difficulty level: 5

Skill: Evaluation

Chapter Name: Trigonometric functions

Key Concept Name: Multiple angle formula

11. In a triangle ABC, $b = 3$, $c = 4$ and $\angle A = 90^\circ$ then the length of internal angle bisector of $\angle A$ is

(A) $\frac{12\sqrt{2}}{7}$ (B) $\frac{6}{7\sqrt{2}}$

(C) $\frac{6\sqrt{2}}{7}$ (D) $\frac{6}{7}$

Solution: (A)

Length of angle bisector of $\angle A = \frac{2bc}{b+c}\cos\frac{A}{2}$

$$= \frac{2\times 3\times 4}{3+4}\cdot\cos 45^\circ = \frac{12\times 2}{7}\times\frac{1}{\sqrt{2}} = \frac{12\sqrt{2}}{7}$$

Ideal Time: 70

Difficulty level: 3

Skill: Rote Learning

Chapter Name: Trigonometric functions

Key Concept Name: Geometry

12. The value of $\cos\frac{\pi}{11} + \cos\frac{3\pi}{11} + \cos\frac{5\pi}{11} + \cos\frac{7\pi}{11} + \cos\frac{9\pi}{11}$ is

(A) 0 (B) $\frac{1}{2}$

(C) 1 (D) 2

Solution: (B)

Use $\cos\alpha + \cos(\alpha+\beta) + \cos(\alpha+2\beta) + \ldots\ldots + \cos(\alpha+(n-1)\beta)$

$$= \frac{\cos\left(\alpha + \frac{(n-1)\beta}{2}\right)\frac{\sin n\beta}{2}}{\sin\frac{\beta}{2}}$$

$$\cos\frac{\pi}{11} + \cos\frac{3\pi}{11} + \cos\frac{5\pi}{11} + \cos\frac{7\pi}{11} + \cos\frac{9\pi}{11}$$

$$= \frac{\cos\left(\frac{\pi}{11} + \frac{4\pi}{11}\right)\sin\frac{5\pi}{11}}{\sin\frac{\pi}{11}} = \frac{1}{2}$$

Ideal Time: 150

Difficulty level: 6

Skill: Evaluation

Chapter Name: Trigonometric functions

Key Concept Name: Transformation formula

13. The value of $\cot\theta - \tan\theta - 2\tan 2\theta - 4\tan 4\theta - 8\cot 8\theta$, is

(A) -1 (B) 0

(C) 1 (D) 2

Solution: (B)

Ideal Time: 120

Difficulty level: 5

Skill: Evaluation

Chapter Name: Trigonometric functions

Key Concept Name: Transformation formula

14. The maximum value of $12\sin\theta - 9\sin^2\theta$ is

(A) 3 (B) 4

(C) 5 (D) 6

Solution: (B)

Ideal Time: 70

Difficulty level: 3

Skill: Evaluation

Chapter Name: Trigonometric functions

Key Concept Name: Range of trigonometric functions

15. If $\cos(A + B) = \frac{4}{5}$ and $\tan A \cdot \tan B = \frac{1}{3}$, then $\sin A \sin B$, is

(A) $\frac{3}{5}$ (B) $\frac{2}{5}$

(C) $\frac{4}{5}$ (D) $\frac{1}{5}$

Solution: (B)

$\cos(A + B) = \frac{4}{5}$

$\tan A \tan B = \frac{1}{3}$

$\Rightarrow 3\sin A \sin B = \cos A \cos B$

$\Rightarrow \cos(A + B) = \cos A \cos B - \sin A \sin B$

$\frac{4}{5} = 3\sin A \sin B - \sin A \sin B$

$\Rightarrow 2\sin A \sin B = \frac{4}{5} \Rightarrow \sin A \sin B = \frac{2}{5}$

Ideal Time: 120

Difficulty level: 5

Skill: Evaluation

Chapter Name: Trigonometric functions

Key Concept Name: Transformation formula

16. The value of $\cos 75^\circ - \sin 105^\circ$ is

(A) $-\frac{1}{2\sqrt{2}}$ (B) $-\frac{1}{\sqrt{2}}$

(C) $\frac{1}{\sqrt{2}}$ (D) $\frac{1}{2\sqrt{2}}$

Solution: (B)

$\cos 75^\circ - \sin 105^\circ = \sin 15^\circ - \sin 75^\circ$

$= \left(\frac{\sqrt{3}-1}{2\sqrt{2}}\right) - \left(\frac{\sqrt{3}+1}{2\sqrt{2}}\right)$

$= -\frac{1}{\sqrt{2}}$

Ideal Time: 75

Difficulty level: 3

Skill: Evaluation

Chapter Name: Trigonometric functions

Key Concept Name: Transformation formula

17. The value of $\frac{\sin 2\alpha - \sin 3\alpha + \sin 4\alpha}{\cos 2\alpha - \cos 3\alpha + \cos 4\alpha}$ is

(A) $\tan 2\alpha$ (B) $\cot 2\alpha$

(C) $\tan 3\alpha$ (D) $\cot 3\alpha$

Solution: (C)

$\frac{\sin 2\alpha - \sin 3\alpha + \sin 4\alpha}{\cos 2\alpha - \cos 3\alpha + \cos 4\alpha} = \frac{2\sin 3\alpha \cdot \cos\alpha - \sin 3\alpha}{2\cos 3\alpha \cdot \cos\alpha - \cos 3\alpha}$

$= \frac{\sin 3\alpha}{\cos 3\alpha}$

$= \tan 3\pi$

Ideal Time: 75

Difficulty level: 3

Skill: Evaluation

Chapter Name: Trigonometric functions

Key Concept Name: Transformation formula

18. The value of expression

$$\frac{2(\sin 1^\circ + \sin 2^\circ + \sin 3^\circ + \ldots\ldots + \sin 89^\circ)}{2(\cos 1^\circ + \cos 2^\circ + \cos 3^\circ + \ldots\ldots + \cos 44^\circ) + 1}$$

equals

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

(C) $\frac{1}{2}$ (D) 0

Solution: (A)

$$\frac{2\{(\sin 1^\circ + \sin 89^\circ) + (\sin 2^\circ + \sin 88^\circ) + \ldots\ldots + (\sin 44^\circ + \sin 46^\circ) + \sin 45^\circ\}}{2(\cos 1^\circ + \cos 2^\circ + \cos 3^\circ + \ldots\ldots + \cos 44^\circ) + 1}$$

$$= \frac{2\{2\sin 45^\circ(\cos 44^\circ + \cos 43^\circ + \ldots\ldots + \cos 1^\circ) + \sin 45^\circ\}}{2(\cos 1^\circ + \cos 2^\circ + \cos 3^\circ + \ldots\ldots + \cos 44^\circ) + 1}$$

$$= \frac{2\sin 45^\circ\{2(\cos 1^\circ + \cos 2^\circ + \ldots\ldots + \cos 44^\circ) + 1\}}{2(\cos 1^\circ + \cos 2^\circ + \ldots\ldots + \cos 44^\circ) + 1}$$

$= 2 \cdot \frac{1}{\sqrt{2}}$

$= \sqrt{2}$

Ideal Time: 120
Difficulty level: 5
Skill: Evaluation
Chapter Name: Trigonometric functions
Key Concept Name: Transformation formula

19. If *a, b, c* represent the sides of a ΔABC such that $a^2 + b^2 + c^2 - 2(a + b + c) + 3 = 0$, then area of ΔABC is

(A) $\frac{\sqrt{3}}{4}$ sq. units (B) 3 sq. units

(C) $\sqrt{3}$ sq. units (D) 4 sq. units

Solution: (A)

$\because a^2 + b^2 + c^2 - 2(a + b + c) + 3 = 0$

$\therefore (a-1)^2 + (b-1)^2 + (c-1)^2 = 0$

$\therefore a = b = c$

$\therefore$ Area of $\Delta ABC = \frac{\sqrt{3}}{4}a^2 = \frac{\sqrt{3}}{4}$ sq. units

Ideal Time: 120
Difficulty level: 5
Skill: Application
Chapter Name: Trigonometric functions
Key Concept Name: Properties of triangle

20. If *A, B* and *C* are angles of a triangle, then $\frac{\sin 2A + \sin 2B + \sin 2C}{\sin A + \sin B + \sin C} =$

(A) $8\sin\frac{A}{2}\cdot\cos\frac{B}{2}\cdot\cos\frac{C}{2}$

(B) $8\sin\frac{A}{2}\cdot\sin\frac{B}{2}\cdot\sin\frac{C}{2}$

(C) $8\cos\frac{A}{2}\cdot\cos\frac{B}{2}\cdot\sin\frac{C}{2}$

(D) $8\cos\frac{A}{2}\cdot\cos\frac{B}{2}\cdot\cos\frac{C}{2}$

Solution: (B)

$\because \sin 2A + \sin 2B + \sin 2C = 4\sin A \times \sin B \times \sin C$

and $\sin A + \sin B + \sin C = 4\cos\frac{A}{2}\cdot\cos\frac{B}{2}\cdot\cos\frac{C}{2}$

and $\sin A = 2\sin\frac{A}{2}\cdot\cos\frac{A}{2}$

Ideal Time: 75
Difficulty level: 3
Skill: Rote Learning
Chapter Name: Trigonometric functions
Key Concept Name: Properties of triangle

21. The values of θ in interval $(0, 2\pi)$ which satisfy the equation $\tan 2\theta \cdot \tan\theta = 1$ is

(A) $\frac{\pi}{3}, \frac{2\pi}{3}, \pi, \frac{4\pi}{3}, \frac{5\pi}{3}$

(B) $\frac{\pi}{6}, \frac{5\pi}{6}, \frac{7\pi}{6}, \frac{11\pi}{6}$

(C) $\frac{\pi}{4}, \frac{3\pi}{4}, \frac{5\pi}{4}, \frac{7\pi}{4}$

(D) $\frac{\pi}{6}, \frac{5\pi}{6}, \frac{\pi}{2}, \frac{7\pi}{6}, \frac{3\pi}{2}, \frac{11\pi}{6}$

Solution: (B)

$\because \tan 2\theta \cdot \tan\theta = 1$

$\therefore \tan 2\theta = \cot\theta$

$\tan 2\theta = \tan(\frac{\pi}{2} - \theta)$

$\theta = \frac{(2n+1)\pi}{6}$, $n \in I$, But $x \neq 1, 4$ ...

Ideal Time: 120
Difficulty level: 4
Skill: Evaluation
Chapter Name: Trigonometric functions
Key Concept Name: General solutions

22. If the sides of a triangle are in arithmetical progression then

(A) $\cot\frac{A}{2}, \cot\frac{B}{2}, \cot\frac{C}{2}$ are in Arithmetico- Geometric progression

(B) $\cot\frac{A}{2}, \cot\frac{B}{2}, \cot\frac{C}{2}$ are in G.P.

(C) $\tan\frac{A}{2}, \tan\frac{B}{2}, \tan\frac{C}{2}$ are in A.P.

(D) $\tan\frac{A}{2}, \tan\frac{B}{2}, \tan\frac{C}{2}$ are in H.P.

Solution: (D)

a, b, c are in AP.

s–a, s–b, s–c are in AP

$\frac{r}{s-a}, \frac{r}{s-b}, \frac{r}{s-c}$ are in HP

$\tan\frac{A}{2}, \tan\frac{B}{2}, \tan\frac{C}{2}$ are in HP

Ideal Time: 150
Difficulty level: 6
Skill: Application
Chapter Name: Trigonometric functions
Key Concept Name: Properties of triangle

23. Let $\theta \in \left(\frac{\pi}{4}, \frac{\pi}{2}\right)$ and $x = (\tan\theta)^{\tan\theta}$, $y = (\tan\theta)^{\tan\theta}$, $z = (\cot\theta)^{\tan\theta}$ and $u = (\cot\theta)^{\cot\theta}$ then

(A) $x > y > z > u$

(B) $x > y > u > z$

(C) $x > u > y > z$

(D) $u > x > y > z$

Solution: (B)

$\because \theta \in \left(\frac{\pi}{4}, \frac{\pi}{2}\right)$ then $\tan\theta > 1$

and $\cot\theta < 1$

Ideal Time: 150

Difficulty level: 6

Skill: Application

Chapter Name: Trigonometric functions

Key Concept Name: Graphs

24. The minimum value of $3^{\sin^6 x} \times 3^{\cos^6 x}$ is

(A) $\sqrt{3}$ (B) $3^{\frac{1}{4}}$

(C) $3^{\frac{3}{4}}$ (D) $3^{-\frac{1}{4}}$

Solution: (C)

$3^{\sin^6 x + \cos^6 x} = 3^{1 - 3\sin^2 x \cdot \cos^2 x} = 3^{1 - \frac{3}{4}\sin^2 2x}$

Ideal Time: 70

Difficulty level: 5

Skill: Evaluation

Chapter Name: Trigonometric functions

Key Concept Name: Range of trigonometric functions

25. The value of $2\sec^2\alpha - \sec^4\alpha - 2\operatorname{cosec}^2\alpha + \operatorname{cosec}^4\alpha$ is

(A) $\cot^4\alpha + \tan^4\alpha$ (B) $\cot^2\alpha - \tan^2\alpha$

(C) $\cot^4\alpha - \tan^4\alpha$ (D) $\cot^2\alpha + \tan^2\alpha$

Solution: (C)

$2\sec^2\alpha - \sec^4\alpha - 2\operatorname{cosec}^2\alpha + \operatorname{cosec}^4\alpha$

$= 1 - (1 - \sec^2\alpha)^2 + (1 - \operatorname{cosec}^2\alpha)^2 - 1$

$= (\operatorname{cosec}^2\alpha - 1)^2 - (\sec^2\alpha - 1)^2$

$= \cot^4\alpha - \tan^4\alpha$

Ideal Time: 75

Difficulty level: 3

Skill: Evaluation

Chapter Name: Trigonometric functions

Key Concept Name: Identities

26. $f(x) = \sin(\sin^2 x) + \cos(\sin^2 x)$ then the range of $f(x)$ is

(A) $\left[-\sqrt{2}, \sqrt{2}\right]$ (B) $[1, -1]$

(C) $\left[0, \sqrt{2}\right]$ (D) $\left[1, \sqrt{2}\right]$

Solution: (D)

$\because f(x) = \sin(\sin^2 x) + \cos(\sin^2 x)$

$= \sqrt{2}\sin\left(\frac{\pi}{4} + \sin^2 x\right)$

$\therefore 1 \le f(x) \le \sqrt{2}$

Ideal Time: 120

Difficulty level: 5

Skill: Evaluation

Chapter Name: Trigonometric functions

Key Concept Name: Range of trigonometric functions

27. The length of each side of a regular dodecagon is 20 cm then radius of its circumscribing circle is

(A) $10(2 + \sqrt{3})$ cm (B) $10(2 - \sqrt{3})$ cm

(C) $10(\sqrt{6} + \sqrt{2})$ cm (D) $10(\sqrt{6} - \sqrt{2})$ cm

Solution: (C)

Radius of circumcircle $= \frac{10}{\sin 15^\circ}$

$= 10\left(\sqrt{6} + \sqrt{2}\right)$ cm

Ideal Time: 75

Difficulty level: 3

Skill: Evaluation

Chapter Name: Trigonometric functions

Key Concept Name: Properties of triangle

28. The number of solutions of the equation $\sin^2 x - 2\sin x - x^2 - 3 = 0$, $x \in [0, 2\pi]$ is

(A) 2 (B) 4

(C) 0 (D) 1

Solution: (C)

$\sin^2 x - 2\sin x + 1 = x^2 + 4$

$(\sin x - 1)^2 = x^2 + 4$

$\therefore$ No solution exist

$\because \sin x = -1$ then $x \neq 0$

Ideal Time: 150

Difficulty level: 6

Skill: Evaluation

Chapter Name: Trigonometric functions

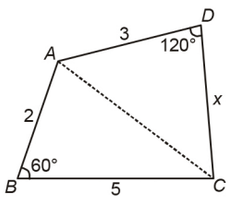
Key Concept Name: Graph

29. The two adjacent sides of cyclic quadrilateral are 2 cm and 5 cm and angle between them is 60°. If the third side is 3 cm, then the length of remaining fourth side is

(A) 2 (B) 4

(C) 6 (D) 3

Solution: (1)



In ΔABC by cosine rule:

$\cos B = \frac{AB^2 + BC^2 - AC^2}{2AB \cdot BC}$

$\therefore AC^2 = 2^2 + 5^2 - 2 \times 2 \times 5 \times \frac{1}{2}$

$AC^2 = 19$

In ΔACD

$\cos 120° = \frac{3^2 + x^2 - 19}{2 \times 3 \times x}$

$\therefore (x + 5)(x - 2) = 0$

$\therefore x = 2$

Ideal Time: 120

Difficulty level: 5

Skill: Evaluation

Chapter Name: Trigonometric functions

Key Concept Name: geometry

30. The number of real solutions of equation $10 \sin x - x = 0$ if $x \in [-5\ \pi, 5\ \pi]$ is

(A) 7 (B) 5

(C) 12 (D) 10

Solution: (A)

Draw the graph of $y = \sin x$ and $y = \frac{x}{10}$ then find the point of intersections.

Ideal Time: 150

Difficulty level: 6

Skill: Evaluation

Chapter Name: Trigonometric functions

Key Concept Name: Graph