

5. TRIGONOMETRY ①

Class: IX, MATHEMATICS

FOUNDATION. SOLUTIONS

TEACHING TASK
IEEE MAINS LEVEL

2025/26

01. A) $\frac{2\pi}{3} = 2 \times 60^\circ = 120^\circ \times$

B) $\frac{4\pi}{3} = 4 \times 60^\circ = 240^\circ \checkmark$

Ans. - B

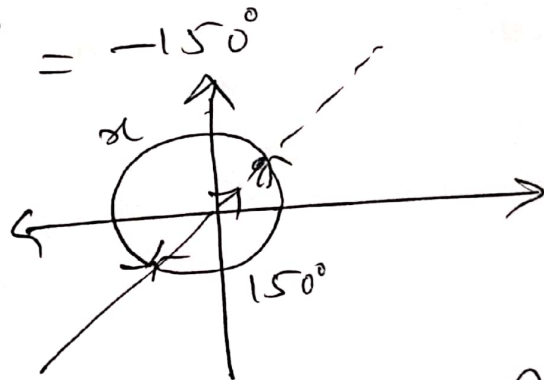
02. A) $-\frac{5\pi}{6} + \frac{7\pi}{6} = \frac{2\pi}{6} = \frac{\pi}{3}$ ~~Ans~~

Given $-\frac{5\pi}{6} = -\frac{5}{6} \times 180^\circ = -150^\circ$

$x^\circ + 150^\circ = 360^\circ$

$x^\circ = 360^\circ - 150^\circ$

$= 210^\circ = \frac{7\pi}{6}$



Ans. A

03. Short cut method

put $x = 30^\circ$

$$\frac{1 - \cos 2A}{\sin 2A} = \frac{1 - \cos 60^\circ}{\sin 60^\circ} = \frac{1 - \frac{1}{2}}{\left(\frac{\sqrt{3}}{2}\right)} = \frac{1}{\sqrt{3}}$$

We know $\tan 30^\circ = \frac{1}{\sqrt{3}}$

Ans. A

04. $\tan A = \frac{\sin A}{\cos A} = 2$

$\Rightarrow \frac{\sin A}{(1/\sqrt{5})} = 2$

$\sin A = 2 \times \frac{1}{\sqrt{5}} = \frac{2}{\sqrt{5}}$

Ans. A

$$05 \quad \cos(360^\circ - x) = \cos x$$

Ans: A
(2)

$$06 \quad \sec 150^\circ = \sec(180^\circ - 30^\circ) \\ = -\sec 30^\circ \\ = -\frac{2}{\sqrt{3}}$$

Ans: D

$$07 \quad \sin 300^\circ = \sin(360^\circ - 60^\circ) = -\sin 60^\circ = -\frac{\sqrt{3}}{2}$$

Ans: D

$$08 \quad \begin{array}{ccc} \sin 90^\circ & + & \cos 180^\circ + \tan 270^\circ = \text{not defined} \\ \downarrow & & \downarrow \\ 1 & & -1 \quad \text{not defined} \end{array}$$

Ans: C

$$09 \quad \tan A = 1 \Rightarrow A = 45^\circ \\ \sin A = \sin 45^\circ = \frac{1}{\sqrt{2}} = x$$

Ans: A

$$10 \quad \sin 30^\circ \cdot \cos 60^\circ + \cos 30^\circ \cdot \sin 60^\circ \\ = \frac{1}{2} \cdot \frac{1}{2} + \frac{\sqrt{3}}{2} \cdot \frac{\sqrt{3}}{2} = \frac{1}{4} + \frac{3}{4} = 1$$

Ans: A

TEE ADVANCED LEVEL

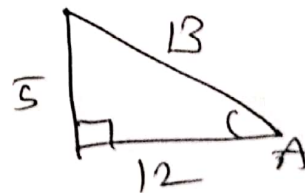
$$01. \quad \sin A = \frac{5}{13}$$

$$A) \cos A = \frac{12}{13} \checkmark$$

$$B) \tan A = \frac{5}{12} \checkmark$$

$$C) \cot A = \frac{13}{12} \times$$

$$D) \sec A = \frac{13}{12} \checkmark$$



Ans: A, B, D

02 A) $90^\circ = \frac{\pi}{2}$ radians ✓ B) 1 radian = $\frac{180}{\pi}$ degrees ✓ C) $360^\circ = 2\pi$ radians ✓ (3)
Ans. A, B, C

03 Statement I: Conceptual (True)
Statement II: Conceptual (True) Ans. A

04 Statement I: Conceptual (True)
Statement II: $\cos \theta = 0 \quad \forall \theta \in (2n+1)\frac{\pi}{2}$ (False)
Ans. C

05 Assertion: Conceptual (True)
Reason: Conceptual (False) Ans. C

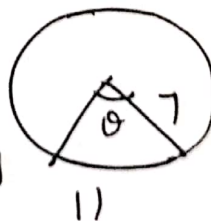
06 Assertion: ~~True~~ Conceptual (True)
Reason: Conceptual (False) Ans. C

07 D) $\cot(90^\circ - A) = \tan A$ Ans. D

08 $\sin(90^\circ - A) = \cos A = \cos 60^\circ = \frac{1}{2}$ Ans. D

09 Conceptual Ans. C

10 We have
 $l = 80$
 $\Rightarrow \theta = \frac{l}{r} = \frac{11}{7}$ radians



Ans. C

11 $\cot 90^\circ = 0, \cot 270^\circ = 0$ Ans. 2

12 $\sin 60^\circ = \frac{\sqrt{3}}{2}$ ✓

Ans. 1/5

13

- ~~sin~~ ()
 a) $\cos \theta (p)$
 b) $\sin \theta (q)$
 c) $\tan \theta (r)$
 d) $-\cos \theta (s)$

Ans. p, q, r, s

14

- a) π radians (p)
 b) ~ 57.3 degrees (q)
 c) $\frac{\pi}{2}$ radians (r)
 d) 2π radians (s)

Ans. p, q, r, s

LEARNERS TASK (QUESTIONS)

01. Conceptual

Ans. B

02. Conceptual

Ans. C

03. Conceptual

Ans. A

04 $\tan \theta = \frac{\sin \theta}{\cos \theta} = \frac{x}{y}$

Ans. A

05. Conceptual

Ans. B

06 Let $\theta = 45^\circ$

$\sec^2 45^\circ - \tan^2 45^\circ = (\sqrt{2})^2 - (1)^2 = 1$

Ans. B

07. Conceptual

Ans. B



08 Conceptual

⑤ Ans: B

09 Conceptual

Ans: C

10

$$\sin x = \cos x \Rightarrow x = 45^\circ$$

Ans: C

JEE MAINS LEVEL

01

$$1080^\circ = 1080 \times 1^\circ$$

$$= 1080 \times \frac{\pi}{180} \text{ radians}$$

$$= 6\pi$$

Ans: B

02

A) $1 \text{ rad} = 57^\circ$ (approx)

B) 60°

C) $1 \text{ rad} = 0.9^\circ$

D) $\frac{\pi}{4} \text{ rad} = 45^\circ$

Ans: B

03

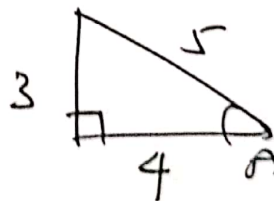
$$\sin \theta = 0 \Rightarrow \theta = 0^\circ, \cot 0^\circ \rightarrow \text{Not defined}$$

Ans: A

04

$$\sin A = \frac{3}{5}$$

$$\therefore \cot A = \frac{4}{3}$$

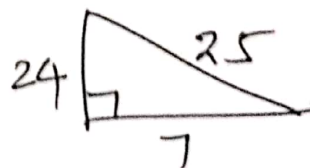


Ans: A

05

$$\cot A = \frac{7}{24}$$

$$\sin A = \frac{24}{25}$$



Ans: B, D

06	$-\sin \theta$	Ans: B
07	200λ	Ans: B
08	Repeated 200λ	Ans: B
09	90°	Ans: B
10	$\sec^2 \theta - \tan^2 \theta = 1$ $b^2 - a^2 = 1$	Ans: B

JEE ADVANCED LEVEL

01	Conceptual	Ans: A, B, C, D
02	$\cot A = 1 \Rightarrow A = 45^\circ$ $\tan 45^\circ = 1, \sin 45^\circ = \cos 45^\circ = \frac{1}{\sqrt{2}}$ $\sec 45^\circ = \csc 45^\circ = \sqrt{2}$	Ans: A, B, C, D
03	<u>Statement I</u> : Conceptual (True) <u>Statement II</u> : Conceptual (True)	Ans: A
04	<u>Statement I</u> : Conceptual (True) <u>Statement II</u> : $\sin 0 = 0$ (False)	Ans: C
05	<u>Assertion</u> : Conceptual (True) <u>Reason</u> : Conceptual (True)	Ans: A
06	<u>Assertion</u> : Conceptual (True) <u>Reason</u> : Conceptual (True)	Ans: A
07	$\sin \lambda$	Ans: B

08

-cos θ

(7)
Ans: B

09

$$\tan^2 \theta + 1 = \sec^2 \theta$$

$$\Rightarrow \frac{\sin^2 \theta}{\cos^2 \theta} + 1 = \frac{1}{\cos^2 \theta} \Rightarrow \cos \theta \neq 0 \text{ and } \theta \neq 90^\circ$$

Ans: C, B

10

conceptual

Ans: BC

11.

$$\tan A = \frac{3}{4}$$

$$\tan(90^\circ - B) = \frac{3}{4}$$

$$\cot B = \frac{3}{4}$$

$$\Rightarrow \tan B = \frac{4}{3}$$

Ans: 4

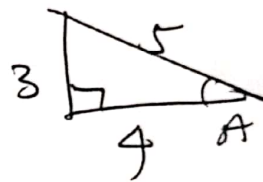
12

$$\sin A = \frac{3}{5}$$

$$\sec^2 A - \tan^2 A$$

$$= \left(\frac{5}{3}\right)^2 - \left(\frac{3}{4}\right)^2 = \frac{25}{9} - \frac{9}{16}$$

$$= \frac{16}{16} = 1$$



Ans: 1

13

a) cos θ (p)

b) -sin θ (q)

c) -cot θ (r)

d) -cosec θ (s)

Ans: p, q, r, s

14

a) sec θ (p)

b) cosec θ (q)

c) 1 (r, s)

d) 1 (r, s)

Ans: p, q, (r, s), (r, s)

⇒ THE END ⇒