# CDS 1 2025

LIVE

# MATHS

## TRIGONOMETRY - 2

## MCQS


NAVJYOTI SIR

Crack
EXAMS

# 14 Feb 2025 Live Classes Schedule

| | | |
|---|---|---|
| 9:00AM | 14 FEBRUARY 2025 DAILY DEFENCE UPDATES | DIVYANSHU SIR |
| 10:00AM | 14 FEBRUARY 2025 DAILY CURRENT AFFAIRS | RUBY MA'AM |

## SSB INTERVIEW LIVE CLASSES

| | | |
|---|---|---|
| 9:30AM | OVERVIEW OF GPE & PRACTICE | ANURADHA MA'AM |

## AFCAT 1 2025 LIVE CLASSES

| | | |
|---|---|---|
| 3:00PM | STATIC GK - STRAITS & INTERNATIONAL BORDERS | DIVYANSHU SIR |
| 4:30PM | ENGLISH - COMPREHENSION - CLASS 2 | ANURADHA MA'AM |

## NDA 1 2025 LIVE CLASSES

| | | |
|---|---|---|
| 10:00AM | MATHS - CONTINUITY | NAVJYOTI SIR |
| 1:00PM | BIOLOGY - CLASS 5 | SHIVANGI MA'AM |
| 4:30PM | ENGLISH - COMPREHENSION - CLASS 2 | ANURADHA MA'AM |

## CDS 1 2025 LIVE CLASSES

| | | |
|---|---|---|
| 1:00PM | BIOLOGY - CLASS 5 | SHIVANGI MA'AM |
| 4:30PM | ENGLISH - COMPREHENSION - CLASS 2 | ANURADHA MA'AM |
| 5:30PM | MATHS - TRIGONOMETRY - CLASS 2 | NAVJYOTI SIR |



**Q)** What is $(\text{cosec } x - \sin x)(\sec x - \cos x)(\tan x + \cot x)$ equal to ?

(a) $\sin x + \cos x$ (b) $\sin x - \cos x$

(c) 2 (d) 1

$$\left(\frac{1}{\sin x} - \sin x\right)\left(\frac{1}{\cos x} - \cos x\right)\left(\frac{\sin x}{\cos x} + \frac{\cos x}{\sin x}\right)$$

$$\left(\frac{1-\sin^2 x}{\sin x}\right)\left(\frac{1-\cos^2 x}{\cos x}\right)\left(\frac{\sin^2 x + \cos^2 x}{\sin x \cos x}\right)$$

$$= \left(\frac{\cos^2 x}{\sin x}\right)\left(\frac{\sin^2 x}{\cos x}\right)\left(\frac{1}{\sin x \cos x}\right) = 1$$

**Q)** What is $(\text{cosec } x - \sin x)(\sec x - \cos x)(\tan x + \cot x)$ equal to ?

(a) $\sin x + \cos x$ (b) $\sin x - \cos x$

(c) 2 (d) 1

**Ans: (d)**

PYQ – 24 – II

What is the maximum value of $8\sin\theta - 4\sin^2\theta$?

(a) 3

(b) 4

(c) 8

(d) 12

$\sin\theta = 1$

$8(1) - 4(1) = 4$

PYQ – 24 – II

What is the maximum value of $8\sin\theta - 4\sin^2\theta$?

(a) 3

(b) 4

(c) 8

(d) 12

Ans: (b)

PYQ – 24 – II

What is
$(1 + \tan\alpha \tan\beta)^2 + (\tan\alpha - \tan\beta)^2$
equal to ?

(a) $\tan^2\alpha \tan^2\beta$

(b) $\sec^2\alpha \sec^2\beta$

(c) $\tan^2\alpha \cot^2\beta$

(d) $\sec^2\alpha \tan^2\beta$

$1 + \tan^2\alpha \tan^2\beta + 2\tan\alpha\tan\beta + \tan^2\alpha + \tan^2\beta - 2\tan\alpha\tan\beta$

$(1 + \tan^2\alpha) + \tan^2\beta(\tan^2\alpha + 1)$

$(1 + \tan^2\alpha)(1 + \tan^2\beta)$

$\sec^2\alpha \sec^2\beta$

PYQ – 24 – II

What is
$(1 + \tan\alpha \tan\beta)^2 + (\tan\alpha - \tan\beta)^2$
equal to ?

(a) $\tan^2\alpha \tan^2\beta$

(b) $\sec^2\alpha \sec^2\beta$

(c) $\tan^2\alpha \cot^2\beta$

(d) $\sec^2\alpha \tan^2\beta$

Ans: (b)

**PYQ – 24 – II**

Consider the following statements :

I. $\tan 50° - \cot 50°$ is positive

II. $\cot 25° - \tan 25°$ is negative

Which of the statements is/are correct ?

(a) I only

(b) II only

(c) Both I and II

(d) Neither I nor II

$\theta \uparrow \Rightarrow \tan\theta \uparrow$

I.) $\tan 50° - \tan 40° > 0$ —— ✓

II.) $\tan 65° - \tan 25° > 0$ —— ✗

PYQ – 24 – II

Consider the following statements :

I. $\tan 50° - \cot 50°$ is positive

II. $\cot 25° - \tan 25°$ is negative

Which of the statements is/are correct ?

(a) I only

(b) II only

(c) Both I and II

(d) Neither I nor II

Ans: (a)

PYQ – 24 – II

If $0 \leqslant (\alpha - \beta) \leqslant (\alpha + \beta) \leqslant \frac{\pi}{2}$,

$\tan(\alpha + \beta) = \sqrt{3}$ and $\tan(\alpha - \beta) = \frac{1}{\sqrt{3}}$,

then what is $\tan\alpha \cdot \cot 2\beta$ equal to ?

(a) 1

(b) $\sqrt{2}$

(c) $\sqrt{3}$

(d) $\frac{1}{\sqrt{3}}$

$\tan(\alpha+\beta) = \sqrt{3} \Rightarrow \alpha + \beta = 60^\circ$ —— (1)

$\tan(\alpha-\beta) = \frac{1}{\sqrt{3}} \Rightarrow \alpha - \beta = 30$ —— (2)

$\alpha = 45^\circ$ ; $\beta = 15^\circ$

$\tan 45^\circ \cot(2 \times 15^\circ) = \tan 45^\circ \cot 30^\circ$

$= 1(\sqrt{3}) = \sqrt{3}$

PYQ – 24 – II

If $0 \leqslant (\alpha - \beta) \leqslant (\alpha + \beta) \leqslant \frac{\pi}{2}$,

$\tan(\alpha + \beta) = \sqrt{3}$ and $\tan(\alpha - \beta) = \frac{1}{\sqrt{3}}$,

then what is $\tan\alpha \cdot \cot 2\beta$ equal to ?

(a) 1

(b) $\sqrt{2}$

(c) $\sqrt{3}$

(d) $\frac{1}{\sqrt{3}}$

Ans: (c)

PYQ – 24 – II

If $64^{\sin^2\theta} + 64^{\cos^2\theta} = 16$

where $0 \leqslant \theta \leqslant \frac{\pi}{2}$,

then what is the value of $\tan\theta + \cot\theta$ ?

(a) 1

(b) 2

(c) 3

(d) 4

$64^{\sin^2\theta} + 64^{\cos^2\theta} = 16$

$\Rightarrow \sin^2\theta = \frac{1}{2} \qquad \cos^2\theta = \frac{1}{2}$

$\sin\theta = \cos\theta = \frac{1}{\sqrt{2}}$

$\Rightarrow \theta = 45^\circ$

$\tan 45^\circ + \cot 45^\circ$

$= 1 + 1 = 2$

PYQ – 24 – II

If $64^{\sin^2\theta} + 64^{\cos^2\theta} = 16$

where $0 \leqslant \theta \leqslant \frac{\pi}{2}$,

then what is the value of $\tan\theta + \cot\theta$ ?

(a) 1

(b) 2

(c) 3

(d) 4

Ans: (b)

PYQ – 24 – II

If
$\operatorname{cosec}\theta - \cot\theta = m$ and $\sec\theta - \tan\theta = n$,
then what is $\operatorname{cosec}\theta + \sec\theta$ equal to ?

(a) $\frac{1}{2}\left(m+n+\frac{1}{m}+\frac{1}{n}\right)$

(b) $\left(m+n+\frac{1}{m}+\frac{1}{n}\right)$

(c) $\frac{1}{2}\left(m+n-\frac{1}{m}-\frac{1}{n}\right)$

(d) $\left(m+n-\frac{1}{m}-\frac{1}{n}\right)$

$\theta = 45°$

$m = \sqrt{2}-1$ $\quad n = \sqrt{2}-1$

$\frac{1}{m} = \sqrt{2}+1$ $\quad \frac{1}{n} = \sqrt{2}+1$

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

$\operatorname{cosec}\theta + \sec\theta = \sqrt{2}+\sqrt{2}$

$= \underline{2\sqrt{2}}$

PYQ – 24 – II

If
$\operatorname{cosec}\theta - \cot\theta = m$ and $\sec\theta - \tan\theta = n$,
then what is $\operatorname{cosec}\theta + \sec\theta$ equal to ?

(a) $\frac{1}{2}\left(m+n+\frac{1}{m}+\frac{1}{n}\right)$

(b) $\left(m+n+\frac{1}{m}+\frac{1}{n}\right)$

(c) $\frac{1}{2}\left(m+n-\frac{1}{m}-\frac{1}{n}\right)$

(d) $\left(m+n-\frac{1}{m}-\frac{1}{n}\right)$

Ans: (a)

PYQ – 24 – II

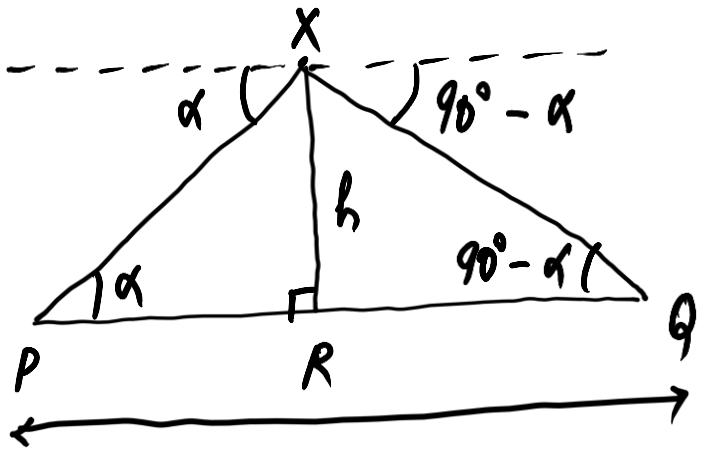
From a point $X$ on a bridge across a river, the angles of depression of two points $P$ and $Q$ on the banks on opposite side of the river are $\alpha$ and $\beta$ respectively. If the point $X$ is at a height $h$ above the surface of the river, what is the width of the river if $\alpha$ and $\beta$ are complementary ?

(a) $2h(\tan\alpha + \cot\alpha)$

(b) $H\tan\alpha \cdot \tan\beta$

(c) $h\cot\alpha \cdot \cot\beta$

(d) $h\sec\alpha \cdot \operatorname{cosec}\alpha$




width of river = PR + RQ

$\triangle PRX$,

$\tan\alpha = \frac{h}{PR}$

$PR = \frac{h}{\tan\alpha} = h\cot\alpha$ — (1)

$\triangle QRX$,

$\tan(90° - \alpha) = \frac{h}{RQ}$

$RQ = \frac{h}{\cot\alpha} = h\tan\alpha$

$h \cot\alpha + h \tan\alpha$

$h(\cot\alpha + \tan\alpha)$

$$h\left(\frac{1}{\cos\alpha \sin\alpha}\right) = h\left(\frac{1}{\cos\alpha}\right)\left(\frac{1}{\sin\alpha}\right) = h \sec\alpha \operatorname{cosec}\alpha$$

PYQ – 24 – II

From a point $X$ on a bridge across a river, the angles of depression of two points $P$ and $Q$ on the banks on opposite side of the river are $\alpha$ and $\beta$ respectively. If the point $X$ is at a height $h$ above the surface of the river, what is the width of the river if $\alpha$ and $\beta$ are complementary ?

(a) $2h(\tan\alpha + \cot\alpha)$

(b) $H\tan\alpha \cdot \tan\beta$

(c) $h\cot\alpha \cdot \cot\beta$

(d) $h\sec\alpha \cdot \operatorname{cosec}\alpha$

Ans: (d)

PYQ – 24 – II

If $p$ and $q$ are the roots of the equation $x^2 - \sin^2\theta\, x - \cos^2\theta = 0$, then what is the minimum value of $p^2 + q^2$?

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

(b) 1

(c) $\frac{3}{2}$

(d) 2

$p+q = \sin^2\theta \qquad pq = -\cos^2\theta$

$p^2+q^2 = (p+q)^2 - 2pq$

$= (\sin^2\theta)^2 - 2(-\cos^2\theta)$

$= \underline{\sin^4\theta + 2\cos^2\theta}$

$\theta = 0^\circ \longrightarrow 0 + 2 = 2$

$\theta = \frac{\pi}{2} \longrightarrow 1 + (0) = \underline{1}$

$\theta = \pi \longrightarrow 0 + 2 = 2$

PYQ – 24 – II

If $p$ and $q$ are the roots of the equation $x^2 - \sin^2\theta\, x - \cos^2\theta = 0$, then what is the minimum value of $p^2 + q^2$ ?

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

(b) 1

(c) $\frac{3}{2}$

(d) 2

Ans: (b)

PYQ – 24 – II

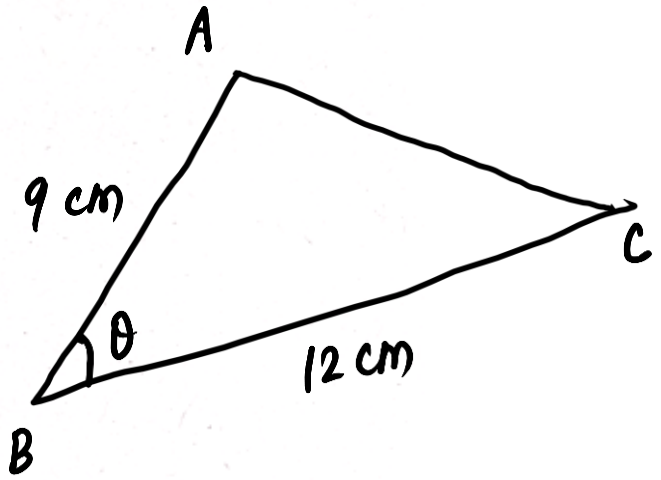
Let $ABC$ be a triangle with area 36 square cm. If $AB = 9$ cm, $BC = 12$ cm and $\angle ABC = \theta$, then what is $\cos\theta$ equal to ?

(a) $\frac{\sqrt{5}}{3}$

(b) $\frac{\sqrt{5}}{4}$

(c) $\frac{1}{3}$

(d) $\frac{2}{3}$




$$\text{Area} = \frac{1}{2}(a)(b)\sin C$$

OR

$$\frac{1}{2}(b)(c)\sin A$$

OR

$$\frac{1}{2}(c)(a)\sin B$$

$$36 = \frac{1}{2}(9)(12)\sin\theta$$

$$\sin\theta = \frac{2}{3} \Rightarrow \cos\theta = \frac{\sqrt{3^2 - 2^2}}{3} = \frac{\sqrt{5}}{3}$$

PYQ – 24 – II

Let $ABC$ be a triangle with area 36 square cm. If $AB = 9$ cm, $BC = 12$ cm and $\angle ABC = \theta$, then what is $\cos\theta$ equal to ?

(a) $\frac{\sqrt{5}}{3}$

(b) $\frac{\sqrt{5}}{4}$

(c) $\frac{1}{3}$

(d) $\frac{2}{3}$

Ans: (a)

PYQ – 24 – II

What is

$$\left(\frac{\cos\theta-\sin\theta+1}{\cos\theta+\sin\theta-1}\right)(\cot\theta-\operatorname{cosec}\theta)$$

equal to ?

(a) –1

(b) 0

(c) 1

(d) 2

Let $\theta = 45^\circ$

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

$$= -1$$

PYQ – 24 – II

What is

$$\left(\frac{\cos\theta-\sin\theta+1}{\cos\theta+\sin\theta-1}\right)(\cot\theta-\operatorname{cosec}\theta)$$

equal to ?

(a) $-1$

(b) 0

(c) 1

(d) 2

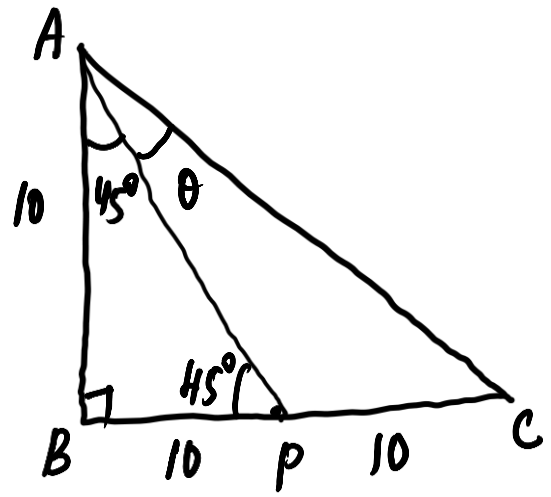
Ans: (a)

PYQ – 24 – II

Let $ABC$ be a triangle right-angled at $B$. Let $P$ be the point on $BC$ such that $BP = PC$. If $AB = 10$ cm, $\angle BAP = 45°$ and $\angle CAP = \theta$

$\left(\text{use } \tan(\alpha+\beta) = \dfrac{\tan\alpha + \tan\beta}{1 - \tan\alpha\tan\beta}\right)$

What is $\tan\theta$ equal to ?




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

(b) $\frac{1}{3}$

(c) $\frac{1}{4}$

(d) $\frac{1}{5}$

$\triangle ABC$,

$$\tan(45° + \theta) = \frac{10+10}{10}$$

$$\frac{1+\tan\theta}{1-\tan\theta} = \frac{2}{1} \Rightarrow 1+\tan\theta = 2 - 2\tan\theta$$

$$3\tan\theta = 1 \Rightarrow \tan\theta = \frac{1}{3}$$

PYQ – 24 – II

Let $ABC$ be a triangle right-angled at $B$. Let $P$ be the point on $BC$ such that $BP = PC$. If $AB = 10$ cm, $\angle BAP = 45°$ and $\angle CAP = \theta$

$\left( \text{use } \tan(\alpha+\beta) = \dfrac{\tan\alpha + \tan\beta}{1 - \tan\alpha \tan\beta} \right)$

What is $\tan\theta$ equal to ?

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

(b) $\frac{1}{3}$

(c) $\frac{1}{4}$

(d) $\frac{1}{5}$

Ans: (b)

PYQ – 24 – II

Let $ABC$ be a triangle right-angled at $B$. Let $P$ be the point on $BC$ such that $BP = PC$. If $AB = 10$ cm, $\angle BAP = 45°$ and $\angle CAP = \theta$

$$\left(\text{use } \tan(\alpha+\beta) = \frac{\tan\alpha + \tan\beta}{1 - \tan\alpha\tan\beta}\right)$$

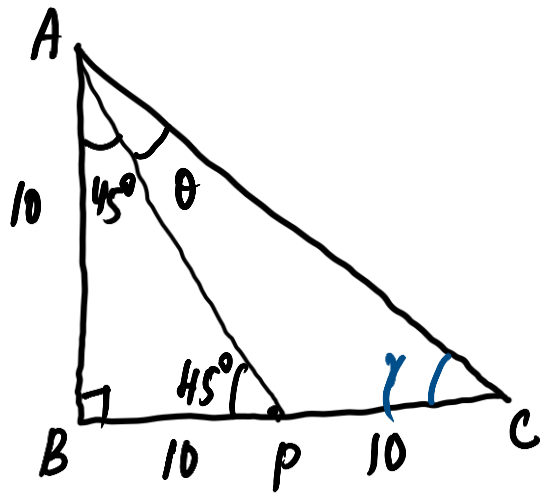
If $\angle ACP = \gamma$, then what is $\tan\gamma$ equal to ?

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

(b) $\frac{1}{3}$

(c) $\frac{2}{3}$

(d) 1




$$\tan\gamma = \frac{10}{10+10} = \frac{1}{2}$$

PYQ – 24 – II

Let $ABC$ be a triangle right-angled at $B$. Let $P$ be the point on $BC$ such that $BP = PC$. If $AB = 10$ cm, $\angle BAP = 45°$ and $\angle CAP = \theta$

$\left( \text{use } \tan(\alpha+\beta) = \dfrac{\tan\alpha + \tan\beta}{1 - \tan\alpha \tan\beta} \right)$

If $\angle ACP = \gamma$, then what is $\tan\gamma$ equal to ?

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

(b) $\frac{1}{3}$

(c) $\frac{2}{3}$

(d) 1

Ans: (a)

**PYQ – 24 – II**

Let $ABC$ be a triangle right-angled at $B$.
Let $P$ be the point on $BC$ such that $BP = PC$.
If $AB = 10$ cm, $\angle BAP = 45°$ and $\angle CAP = \theta$

$\left(\text{use } \tan(\alpha+\beta) = \dfrac{\tan\alpha + \tan\beta}{1 - \tan\alpha\tan\beta}\right)$

Consider the following statements :

I. The line segment $AP$ divides the area of the triangle $ABC$ into two equal parts ✓

II. The perimeter of the triangle $APC$ is more than 46 cm ✓

III. The area of the triangle $APC$ is 50 square cm ✓

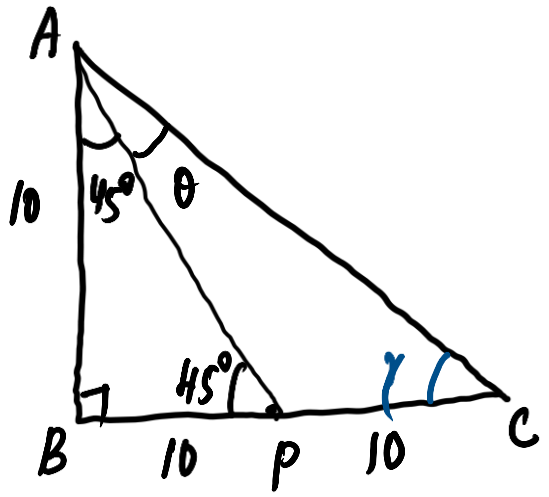
Which of the statements given above are correct ?

(a) I and II only

(b) II and III only

(c) I and III only

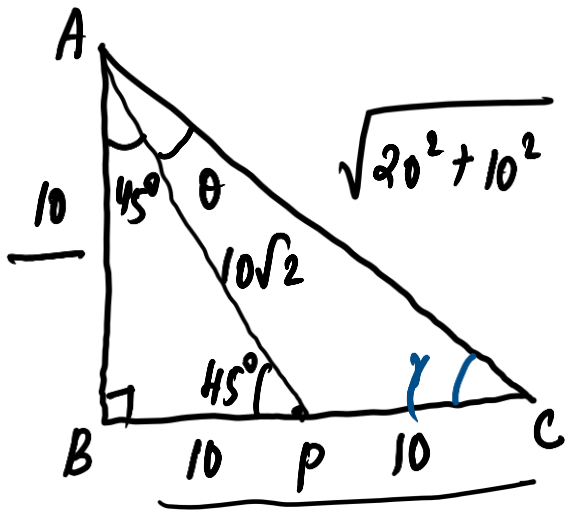
(d) I, II and III




(I) $ar(\triangle ABP) = \frac{1}{2} \times 10 \times 10 = 50\ cm^2$

(III) $ar(\triangle APC) = ar(\triangle ABC) - ar(\triangle ABP)$

$= \frac{1}{2} \times 20 \times 10 - 50 = 50\ cm^2$




$10 + \sqrt{500} + AP$

$10 + 10\sqrt{5} + 10\sqrt{2}$

$10(1 + \sqrt{5} + \sqrt{2})$

$10(1 + 2.25 + 1.414$

$10(4.664) \sim 46.64 > 46\ cm$

PYQ – 24 – II

Let $ABC$ be a triangle right-angled at $B$.
Let $P$ be the point on $BC$ such that $BP = PC$.
If $AB = 10$ cm, $\angle BAP = 45°$ and $\angle CAP = \theta$

$\left(\text{use } \tan(\alpha+\beta) = \dfrac{\tan\alpha + \tan\beta}{1 - \tan\alpha\tan\beta}\right)$

Consider the following statements :

I. The line segment $AP$ divides the area of the triangle $ABC$ into two equal parts

II. The perimeter of the triangle $APC$ is more than 46 cm

III. The area of the triangle $APC$ is 50 square cm

Which of the statements given above are correct ?

(a) I and II only

(b) II and III only

(c) I and III only

(d) I, II and III

Ans: (d)

**Q)** If $a^2 = \dfrac{1+2\sin\theta\cos\theta}{1-2\sin\theta\cos\theta}$, then what is the value of $\dfrac{a+1}{a-1}$?

(a) $\sec\theta$ (b) 1

(c) 0 (d) $\tan\theta$

$a = 2+\sqrt{3}$

$\theta = 60^\circ$

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

$$\frac{a+1}{a-1} = \frac{2+\sqrt{3}+1}{2+\sqrt{3}-1}$$

$$= \frac{3+\sqrt{3}}{1+\sqrt{3}} \times \frac{1-\sqrt{3}}{1-\sqrt{3}}$$

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

$\tan 60^\circ = \sqrt{3}$ ($\tan\theta$)

**Q)** If $a^2 = \dfrac{1+2\sin\theta\cos\theta}{1-2\sin\theta\cos\theta}$, then what is the value of $\dfrac{a+1}{a-1}$?

(a) $\sec\theta$
(b) 1
(c) 0
(d) $\tan\theta$

**Ans: (d)**

**Q)** The value of

$$\frac{\cot 5^\circ.\cot 10^\circ.\cot 15^\circ.\cot 60^\circ.\cot 75^\circ.\cot 80^\circ.\cot 85^\circ}{(\cos^2 20^\circ + \cos^2 70^\circ) + 2}$$ is

(a) $\frac{9}{\sqrt{3}}$ (b) $\frac{1}{9}$ (c) $\frac{1}{\sqrt{3}}$ (d) $\frac{\sqrt{3}}{9}$

**Q)** The value of

$$\frac{\cot 5^\circ.\cot 10^\circ.\cot 15^\circ.\cot 60^\circ.\cot 75^\circ.\cot 80^\circ.\cot 85^\circ}{(\cos^2 20^\circ + \cos^2 70^\circ) + 2}$$ is

(a) $\frac{9}{\sqrt{3}}$ (b) $\frac{1}{9}$ (c) $\frac{1}{\sqrt{3}}$ (d) $\frac{\sqrt{3}}{9}$

**Ans: (d)**

**Q)** If $\sin 17^\circ = \frac{x}{y}$, then $\sec 17^\circ - \sin 73^\circ$ is equal to

(a) $\frac{y}{\sqrt{y^2 - x^2}}$

(b) $\frac{y^2}{\left(x\sqrt{y^2 - x^2}\right)}$

(c) $\frac{x}{\left(y\sqrt{y^2 - x^2}\right)}$

(d) $\frac{x^2}{\left(y\sqrt{y^2 - x^2}\right)}$

**Q)** If $\sin 17^\circ = \frac{x}{y}$, then $\sec 17^\circ - \sin 73^\circ$ is equal to

(a) $\frac{y}{\sqrt{y^2 - x^2}}$

(b) $\frac{y^2}{\left(x\sqrt{y^2 - x^2}\right)}$

(c) $\frac{x}{\left(y\sqrt{y^2 - x^2}\right)}$

(d) $\frac{x^2}{\left(y\sqrt{y^2 - x^2}\right)}$

**Ans: (d)**

**Q)** If $0° < \theta < 90°$, then all the trigonometric ratios can be obtained when

(a) only $\sin\theta$ is given

(b) only $\cos\theta$ is given

(c) only $\tan\theta$ is given

(d) any one of the six ratios is given

**Q)** If $0° < \theta < 90°$, then all the trigonometric ratios can be obtained when

(a) only $\sin\theta$ is given

(b) only $\cos\theta$ is given

(c) only $\tan\theta$ is given

(d) any one of the six ratios is given

**Ans: (d)**

**Q)** If $\cos x + \sec x = 2$, then what $\cos^n x + \sec^n x$ equal to, where n is a positive integer?

(a) 2
(b) $2^{n-2}$
(c) $2^{n-1}$
(d) $2^n$

**Q)** If $\cos x + \sec x = 2$, then what $\cos^n x + \sec^n x$ equal to, where n is a positive integer?

(a) 2
(b) $2^{n-2}$
(c) $2^{n-1}$
(d) $2^n$

**Ans: (a)**

**Q)** If $\frac{3-\tan^2 A}{1-3\tan^2 A} = K$

where K is a real number, then cosec A$(3\sin A - 4\sin^3 A)$ is equal to

(a) $\frac{2K}{K-1}$

(b) $\frac{2K}{K-1}$, where $\frac{1}{3} \le K \le 3$

(c) $\frac{2K}{K-1}$, where $K < \frac{1}{3}$ or $K > 3$

(d) $\frac{2K}{K+1}$

**Q)** If $\frac{3-\tan^2 A}{1-3\tan^2 A} = K$

where K is a real number, then cosec A$(3\sin A - 4\sin^3 A)$ is equal to

(a) $\frac{2K}{K-1}$

(b) $\frac{2K}{K-1}$, where $\frac{1}{3} \le K \le 3$

(c) $\frac{2K}{K-1}$, where $K < \frac{1}{3}$ or $K > 3$

(d) $\frac{2K}{K+1}$

**Ans: (c)**

**Q)** If $\sin\theta = \sqrt{3}\cos\theta$, $0° < \theta < 90°$, then the value of $2\sin^2\theta + \sec^2\theta + \sin\theta\sec\theta + \operatorname{cosec}\theta$ is:

(a) $\frac{33+10\sqrt{3}}{6}$

(b) $\frac{19+10\sqrt{3}}{6}$

(c) $\frac{33+10\sqrt{3}}{3}$

(d) $\frac{19+10\sqrt{3}}{3}$

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**Ans: (a)**

**Q)** What is the value of

$$\frac{\left\{\begin{array}{l}\left[4\cos(90-A)\sin^3(90+A)\right]- \\ \left[4\sin(90+A)\cos^3(90-A)\right]\end{array}\right\}}{\cos\left(\frac{180+8A}{2}\right)}?$$

(a) 1 (b) $-1$ (c) 0 (d) 2

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**Ans: (b)**

**Q)** If the sides of a triangle are 6cm, 10cm and 14 cm, then what is the largest angle included by the sides?

(a) 90°
(b) 120°
(c) 135°
(d) 150°

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**Ans: (b)**

**Q)** If $(\sin x + \operatorname{cosec} x)^2 + (\cos x + \sec x)^2$

$$= k + \tan^2 x + \cot^2 x,$$

then what is the value of $k$?

(a) 8 (b) 7

(c) 4 (d) 3

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**Ans: (b)**

**Q)** If $\sec\theta - \operatorname{cosec}\theta = \frac{4}{3}$, then what is $(\sin\theta - \cos\theta)$ equal to

(a) Only –2

(b) Only $\frac{1}{2}$

(c) Both –2 and $\frac{1}{2}$

(d) Neither $\frac{1}{2}$ nor –2

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**Ans: (c)**

**Q)** The value of $\dfrac{\cos^3 20^\circ - \cos^3 70^\circ}{\sin^3 70^\circ - \sin^3 20^\circ}$ is

(a) $\dfrac{1}{2}$ (b) $\dfrac{1}{\sqrt{2}}$ (c) 1 (d) 2

**Q)** The value of $\dfrac{\cos^3 20^\circ - \cos^3 70^\circ}{\sin^3 70^\circ - \sin^3 20^\circ}$ is

(a) $\dfrac{1}{2}$ (b) $\dfrac{1}{\sqrt{2}}$ (c) 1 (d) 2

**Ans: (c)**

**Q)** If $\operatorname{cosec}\theta - \sin\theta = p^3$ and $\sec\theta - \cos\theta = q^3$, then what is the value of $\tan\theta$?

(a) $\frac{p}{q}$ (b) $\frac{q}{p}$ (c) $pq$ (d) $p^2q^2$

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$(a)\ \frac{p}{q}$ $(b)\ \frac{q}{p}$ $(c)\ pq$ $(d)\ p^2q^2$

**Ans: (b)**

**Q)** From an aeroplane flying about a river at an altitude of 1200 m, it is observed that the angles of depression of opposite points on the two banks of a river are $30°$ and $\theta$. If the width of the river is 3000 m, then which one of the following is correct ?

(a) $\theta < 30°$ (b) $30° < \theta < 45°$

(c) $45° < \theta < 60°$ (d) $60° < \theta < 90°$

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**Ans: (c)**

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LIVE

# MATHS

## ALGEBRA - 1

## MCQS


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