

Chapter

03

Trigonometric Ratios



Practice Section-01



Q.1 If $0^\circ < x < 90^\circ$ & $\cos x = \frac{3}{\sqrt{10}}$, then the value of $\log_{10} \sin x + \log_{10} \cos x + \log_{10} \tan x$ is

- (1) 0 (2) 1 (3) -1 (4) 2

Q.2 If $\tan \alpha + \cot \alpha = a$ then the value of $\tan^4 \alpha + \cot^4 \alpha =$

- (1) $a^4 + 4a^2 + 2$ (2) $a^4 - 4a^2 + 2$ (3) $a^4 - 4a^2 - 2$ (4) $a^4 - 2a^2 + 2$

Q.3
$$\frac{\tan \left(x - \frac{\pi}{2} \right) \cdot \cos \left(\frac{3\pi}{2} + x \right) - \sin^3 \left(\frac{7\pi}{2} - x \right)}{\cos \left(x - \frac{\pi}{2} \right) \cdot \tan \left(\frac{3\pi}{2} + x \right)}$$
 when simplified reduces to:

- (1) $\sin x \cos x$ (2) $-\sin^2 x$
(3) $-\sin x \cos x$ (4) $\sin^2 x$

Q.4 The expression $3 \left[\sin^4 \left(\frac{3\pi}{2} - \alpha \right) + \sin^4 (3\pi + \alpha) \right] - 2 \left[\sin^6 \left(\frac{\pi}{2} + \alpha \right) + \sin^6 (5\pi + \alpha) \right]$ is equal to

- (1) 0 (2) 1 (3) 3 (4) $\sin 4\alpha + \sin 6\alpha$

Q.5 The value of the expression $\left(1 + \cos \frac{\pi}{10} \right) \left(1 + \cos \frac{3\pi}{10} \right) \left(1 + \cos \frac{7\pi}{10} \right) \left(1 + \cos \frac{9\pi}{10} \right)$ is

- (1) $\frac{1}{8}$ (2) $\frac{1}{16}$ (3) $\frac{1}{4}$ (4) 0

Q.6 The value of $\frac{\sin 24^\circ \cos 6^\circ - \sin 6^\circ \sin 66^\circ}{\sin 21^\circ \cos 39^\circ - \cos 51^\circ \sin 69^\circ}$ is

- (1) -1 (2) 1 (3) 2 (4) 0

MATHEMATICS

Q.7 If $\tan A$ and $\tan B$ are the roots of the quadratic equation $x^2 - ax + b = 0$, then the value of $\sin^2 (A + B)$.

(1) $\frac{a^2}{a^2 + (1-b)^2}$

(2) $\frac{a^2}{a^2 + b^2}$

(3) $\frac{a^2}{(b+c)^2}$

(4) $\frac{a^2}{b^2 (1-a)^2}$

Q.8 If $\tan 25^\circ = x$, then $\frac{\tan 155^\circ - \tan 115^\circ}{1 + \tan 155^\circ \tan 115^\circ}$ is equal to

(1) $\frac{1-x^2}{2x}$

(2) $\frac{1+x^2}{2x}$

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

(4) $\frac{1-x^2}{1+x^2}$

Q.9 $\sin 15^\circ + \cos 105^\circ =$

(1) 0

(2) $2 \sin 15^\circ$

(3) $\cos 15^\circ + \sin 15^\circ$

(4) $\sin 15^\circ - \cos 15^\circ$

Q.10 The value of $\cot (675^\circ)$ is

(1) -1

(2) 1

(3) $\sqrt{3}$

(4) $-\sqrt{3}$

Q.11 The circular wire of diameter 10 cm is cut and placed along the circumference of a circle of diameter 1 metre. The angle subtended by the wire at the centre of the circle is equal to

(1) $\frac{\pi}{4}$ radian

(2) $\frac{\pi}{3}$ radian

(3) $\frac{\pi}{5}$ radian

(4) $\frac{\pi}{10}$ radian

Q.12 The angle subtended at the centre of the circle of diameter 50 cm by an arc of 11 cm, is (in degree)

(1) $22^\circ 10'$

(2) $23^\circ 10'$

(3) $20^\circ 12'$

(4) $25^\circ 12'$



Practice Section-02



Q.1 If $\cot \alpha + \tan \alpha = m$ and $\frac{1}{\cos \alpha} - \cos \alpha = n$, then

(1) $m(mn^2)^{1/3} - n(nm^2)^{1/3} = 1$

(2) $m(m^2n)^{1/3} - n(mn^2)^{1/3} = 1$

(3) $n(mn^2)^{1/3} - m(nm^2)^{1/3} = 1$

(4) $n(m^2n)^{1/3} - m(mn^2)^{1/3} = 1$

Q.2 $\sin\left(\frac{\pi}{10}\right)\sin\left(\frac{3\pi}{10}\right) =$

(1) $1/2$

(2) $-1/2$

(3) $1/4$

(4) 1

Q.3 $\cot x - \tan x =$

(1) $\cot 2x$

(2) $2 \cot^2 x$

(3) $2 \cot 2x$

(4) $\cot^2 2x$

Q.4 $\frac{1}{4}[\sqrt{3} \cos 23^\circ - \sin 23^\circ] =$

(1) $\cos 43^\circ$

(2) $\cos 7^\circ$

(3) $\cos 53^\circ$

(4) None of these

Q.5 If $\cos A = \frac{\sqrt{3}}{2}$, then $\tan 3A =$

(1) 0

(2) $1/2$

(3) 1

(4) ∞

Q.6 $\sin^4 \frac{\pi}{8} + \sin^4 \frac{3\pi}{8} + \sin^4 \frac{5\pi}{8} + \sin^4 \frac{7\pi}{8} =$

(1) $1/2$

(2) $1/4$

(3) $3/2$

(4) $3/4$

Q.7 $\frac{\sin 3A - \cos\left(\frac{\pi}{2} - A\right)}{\cos A + \cos(\pi + 3A)} =$

(1) $\tan A$

(2) $\cot A$

(3) $\tan 2A$

(4) $\cot 2A$

Q.8 The greatest and least value of $\sin x \cos x$ are

(1) $1, -1$

(2) $\frac{1}{2}, -\frac{1}{2}$

(3) $\frac{1}{4}, -\frac{1}{4}$

(4) $2, -2$

MATHEMATICS

Q.9 If $\sin \alpha = \frac{-3}{5}$, where $\pi < \alpha < \frac{3\pi}{2}$, then $\cos \frac{1}{2}\alpha =$

(1) $\frac{-1}{\sqrt{10}}$

(2) $\frac{1}{\sqrt{10}}$

(3) $\frac{3}{\sqrt{10}}$

(4) $\frac{-3}{\sqrt{10}}$

Q.10 If $\tan (A+B) = p$ and $\tan (A-B) = q$, then $\tan 2A$ is equal to

(1) $\frac{p+q}{p-q}$

(2) $\frac{p-q}{1+pq}$

(3) $\frac{p+q}{1-pq}$

(4) $\frac{1+pq}{1-p}$

Q.11 If $\tan \beta = \cos \theta \cdot \tan \alpha$, then $\tan^2 \left(\frac{\theta}{2} \right) =$

(1) $\frac{\sin(\alpha+\beta)}{\sin(\alpha-\beta)}$

(2) $\frac{\cos(\alpha-\beta)}{\cos(\alpha+\beta)}$

(3) $\frac{\sin(\alpha-\beta)}{\sin(\alpha+\beta)}$

(4) $\frac{\cos(\alpha+\beta)}{\cos(\alpha-\beta)}$

Q.12 If $\tan A = 1/3$ and $\tan B = 1/7$ then

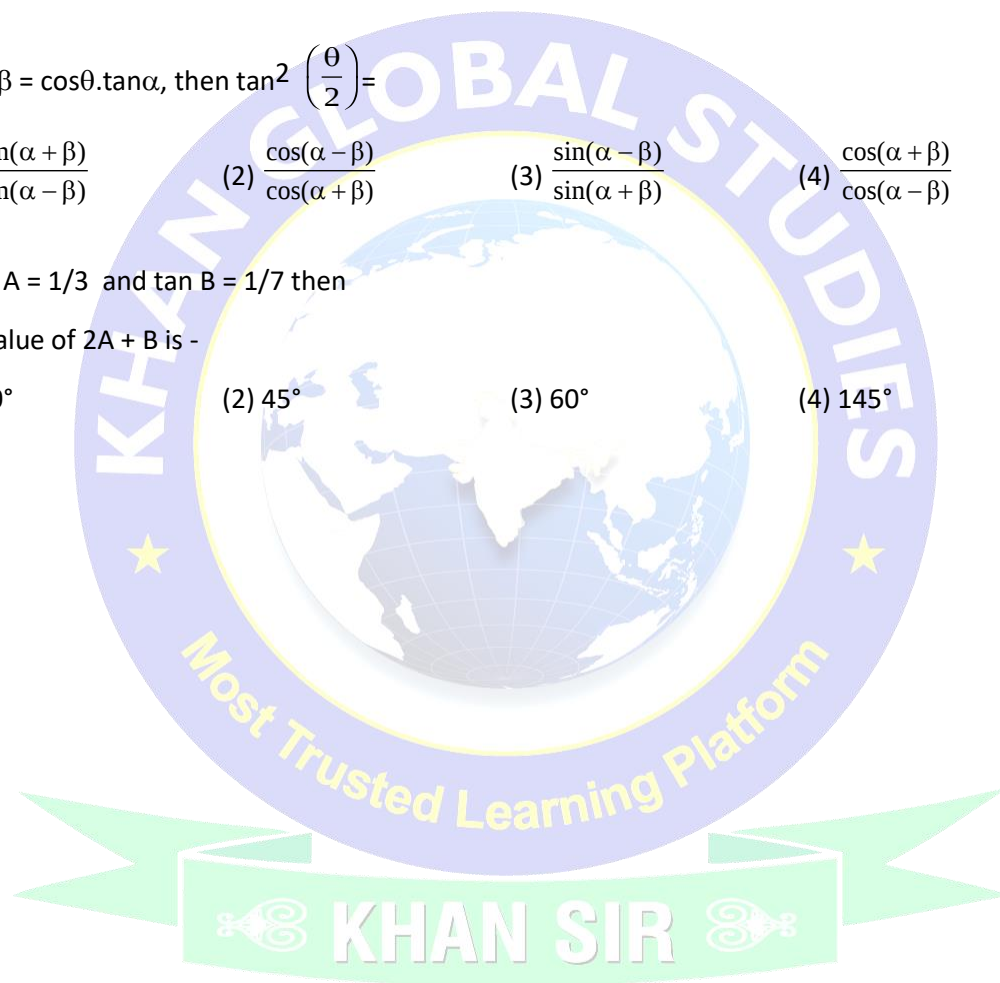
the value of $2A + B$ is -

(1) 30°

(2) 45°

(3) 60°

(4) 145°



ANSWER KEY

PRACTICE SECTION-01

Que.	1	2	3	4	5	6	7	8	9	10	11	12
Ans.	3	2	4	2	2	1	1	1	1	1	3	4

PRACTICE SECTION-02

Que.	1	2	3	4	5	6	7	8	9	10	11	12
Ans.	3	3	3	4	4	3	4	2	1	3	3	2

