

INTRODUCTION TO TRIGONOMETRY

Q.1) If $\sec \theta = \frac{\sqrt{p^2 + q^2}}{q}$ then the value of the

$\frac{p \sin \theta + q \cos \theta}{p \sin \theta + q \cos \theta}$ is :

- (A) $\frac{p}{q}$ (B) $\frac{p^2}{q^2}$
(C) $\frac{p^2 - q^2}{p^2 + q^2}$ (D) $\frac{p^2 + q^2}{p^2 - q^2}$

Q.2) $\sec \theta$ is equal to -

- (A) $\frac{1}{\sqrt{1 - \cos^2 \theta}}$ (B) $\frac{\sqrt{1 + \cot^2 \theta}}{\cot \theta}$
(C) $\frac{\cot \theta}{\sqrt{1 + \cot^2 \theta}}$ (D) $\frac{\sqrt{\operatorname{cosec}^2 \theta - 1}}{\operatorname{cosec} \theta}$

Q.3) $7 \sin^2 \theta + 3 \cos^2 \theta = 4$ then :

- (A) $\tan \theta = \frac{1}{\sqrt{2}}$ (B) $\tan \theta = \frac{1}{2}$
(C) $\tan \theta = \frac{1}{3}$ (D) $\tan \theta = \frac{1}{\sqrt{3}}$

Q.4) The solution of the trigonometric equation

$\frac{\cos^2 \theta}{\cot^2 \theta - \cos^2 \theta} = 3, 0^\circ < \theta < 90^\circ$:

- (A) $\theta = 0^\circ$ (B) $\theta = 30^\circ$
(C) $\theta = 60^\circ$ (D) $\theta = 90^\circ$

Q.5) If $\cot \theta + \cos \theta = p$ and $\cot \theta = q$, then the value of $p^2 - q^2$ is :

- (A) $2\sqrt{pq}$ (B) $4\sqrt{pq}$
(C) $2pq$ (D) $4pq$

Q.6) The value of $\sin^2 15^\circ + \sin^2 30^\circ + \sin^2 45^\circ + \sin^2 60^\circ + \sin^2 75^\circ$ is :

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

- (C) $\frac{5}{2}$ (D) 3

Q.7) The values of x and y which make the following solutions true are: $\cos x^\circ = \sin 52^\circ$ and $\cos y^\circ = \sin (y^\circ + 10)$

- (A) $x = 52^\circ, y = 30^\circ$ (B) $x = 38^\circ, y = 40^\circ$
(C) $x = 48^\circ, y = 52^\circ$ (D) $x = 40^\circ, y = 50^\circ$

Q.8) If $\frac{ax}{\cos \theta} + \frac{by}{\sin \theta} = a^2 - b^2$ and

$\frac{ax \sin \theta}{\cos^2 \theta} - \frac{by \cos \theta}{\sin^2 \theta} = 0$ then $(ax)^{2/3} + (by)^{2/3}$ is equal to :

- (A) $(a^2 - b^2)^{2/3}$ (B) $(a^2 + b^2)^{2/3}$
(C) $(a - b)^{2/3}$ (D) None of these

Q.9) If $y = \frac{2 \sin \alpha}{1 + \cos \alpha + \sin \alpha}$, then $\frac{1 - \cos \alpha + \sin \alpha}{1 + \sin \alpha}$ is equal to :

- (A) $1 + y$ (B) $1 - y$
(C) $\frac{1}{y}$ (D) None of these

Q.10) If $x = \sin^2 \theta \cos \theta$ and $y = \cos^2 \theta \sin \theta$, then :

(A) $(x^2 y)^{2/3} + (x y^2)^{2/3} = 1$

(B) $\left[\frac{x^2}{y} \right]^{2/3} + \left[\frac{y^2}{x} \right]^{2/3} = 1$

- (C) $x^2 + y^2 = x^2 y^2$
(D) None of these

Q.11) If $x = \sec \theta - \tan \theta$ and $y = \operatorname{cosec} \theta + \cot \theta$, then $xy + 1$ is equal to :

- (A) $x + y$ (B) $x - y$
(C) $2x + y$ (D) $y - x$

Q.12) The value of the expression

$1 - \frac{\sin^2 y}{1 + \cos y} + \frac{1 + \cos y}{\sin y} - \frac{\sin y}{1 - \cos y}$ is equal to :

- (A) $\cos y$ (B) 1
(C) 0 (D) $\sin y$
- Q.13** If $\sec\theta = x + \frac{1}{4x}$, $x \in R, x \neq 0$, then the value of $\sec\theta + \tan\theta$ is :
- (A) $2x$ (B) $\frac{1}{2x}$
(C) $2x$ or $\frac{1}{2x}$ (D) None of these
- Q.14** If $x = \cos\theta + b\sin\theta$ and $y = a\sin\theta + \cos\theta$ then $a^2 + b^2$ is equal to :
- (A) $x^2 - y^2$ (B) $x^2 + y^2$
(C) $(x+y)$ (D) None of these
- Q.15** If $\cos\theta + \frac{y}{b}\sin\theta + 1 = 0$ and $\frac{x}{a}\sin\theta - \frac{y}{b}\cos\theta - 1 = 0$ then $\frac{x^2}{a^2} + \frac{y^2}{b^2}$ is equal to :
- (A) 2 (B) 0
(C) -2 (D) 1
- Q.16** If $\sin A + \cos A = m$ and $\sin^3 A + \cos^3 A = n$, then :
- (A) $m^3 + 3m + 2n = 0$ (B) $m^3 - 3m + 2n = 0$
(C) $n^3 - 3n + 2m = 0$ (D) $m^3 - 3m + n = 0$
- Q.17** If $\sin\alpha + \cos\alpha = a$, then $\sin^6\alpha + \cos^6\alpha$ is equal to :
- (A) $1 + \frac{3}{4}(a^2 - 1)^2$ (B) $1 - \frac{3}{4}(a^2 - 1)^2$
(C) $\frac{3 + 4(a^2 - 1)^2}{4}$ (D) $\frac{3 - 3(a^2 - 1)^2}{4}$
- Q.18** If $\cos\theta + \sec\theta = 2$, then the value of $\cos^2\theta + \sec^2\theta$ is :
- (A) 1 (B) 2

- (C) 4 (D) None of these
- Q.19** If $0 \leq x \leq \frac{\pi}{2}$ and $81^{\sin^2 x} + 81^{\cos^2 x} = 30$, then x is equal to :
- (A) $\frac{\pi}{3}$ or $\frac{\pi}{6}$ (B) $\frac{\pi}{4}$ or 0
(C) $\frac{\pi}{2}$ or $\frac{\pi}{4}$ (D) None of these
- Q.20** If $\frac{\sin A}{\sin B} = p$ and $\frac{\cos A}{\cos B} = q$, then $\tan A$ is equal to :
- (A) $\pm \frac{p}{q} \sqrt{\frac{q^2 - 1}{1 - p^2}}$ (B) $\pm \sqrt{\frac{q^2 - 1}{1 - p^2}}$
(C) $\pm \frac{p}{q} \sqrt{\frac{q^2 - 1}{1 - p^2}}$ (D) None of these
- Q.21** If $T_n = \sin^n \theta + \cos^n \theta$, then $\frac{T_3 - T_5}{T_1}$ is equal to :
- (A) $\frac{T_5 - T_7}{T_3}$ (B) $\frac{T_3 - T_5}{T_7}$
(C) $\frac{T_9 - T_6}{T_4}$ (D) $\frac{T_6 - T_9}{T_4}$
- Q.22** If $\sin x + \sin^2 x = 1$, then the value of $\cos^{12} x + 3\cos^8 x + \cos^6 x + 2\cos^4 x + \cos^2 x - 2$ is equal to :
- (A) 0 (B) 1
(C) 2 (D) $\sin^2 x$
- Q.23** $(1 + \tan\alpha \tan\beta)^2 + (\tan\alpha - \tan\beta)^2$ is equal to :
- (A) $\cos^2\alpha \cos^2\beta$ (B) $\tan^2\alpha \tan^2\beta$
(C) $\tan^2\alpha + \tan^2\beta$ (D) $\sec^2\alpha \sec^2\beta$
- Q.24** $\sin^6\theta + \cos^6\theta + 3\sin^2\theta \cos^2\theta$ is equal to :
- (A) 0 (B) 1

- (C) -1 (D) None of these
- Q.25) If $0 < x < \frac{\pi}{2}$, then the largest angle of a triangle whose sides are 1, $\sin x$, $\cos x$ is :
- (A) $\frac{\pi}{2}$ (B) $\frac{\pi}{3}$
(C) $\frac{\pi}{2} - x$ (D) x
- Q.26) ABC is right angled at C, then $\tan A + \tan B =$
- (A) $\frac{a^2}{bc}$ (B) $\frac{c^2}{ab}$
(C) $\frac{b^2}{ac} - x$ (D) $a + b$
- Q.27) The value of the expression $\tan 1^\circ \tan 2^\circ \tan 3^\circ \dots \tan 89^\circ$ is equal to :
- (A) 0 (B) Not defined
(C) 1 (D) ∞
- Q.28) If $\sin \theta_1 + \sin \theta_2 + \sin \theta_3 = 3$ then $\cos \theta_1 + \cos \theta_2 + \cos \theta_3$ is equal to :
- (A) 3 (B) 2
(C) 1 (D) 0
- Q.29) Which of the following is not possible ?
- (A) $\sin \theta = \frac{5}{7}$ (B) $\cos \theta = \frac{1+t^2}{1-t^2}, t \neq 0$
(C) $\tan \theta = 100$ (D) $\sec \theta = \frac{5}{2}$
- Q.30) Which of the following options contains the sides of a right angled triangle ?
- (A) 13, 14, 15 (B) 12, 35, 37
(C) 13, 15, 24 (D) None of these

Answer Sheet

Q.1	C	Q.11	D	Q.21	A
Q.2	B	Q.12	A	Q.22	D
Q.3	D	Q.13	C	Q.23	D
Q.4	C	Q.14	B	Q.24	B
Q.5	B	Q.15	A	Q.25	A
Q.6	C	Q.16	B	Q.26	A
Q.7	B	Q.17	B	Q.27	C
Q.8	A	Q.18	C	Q.28	D
Q.9	D	Q.19	A	Q.29	B
Q.10	B	Q.20	A	Q.30	B