CHAPTER 10

TRIGONOMETRIC IDENTITIES

MULTIPLE CHOICE QUESTIONS

(1) $\sin 2\alpha$ =

(a) $\cos^2\alpha - \sin^2\alpha$ (b) $2\sin^2\alpha + 1$

(c) $2\sin\alpha \cos\alpha$ (d) $\sin\alpha \cdot \cos\alpha$

[Lahore Board 2005-08, Lahore Board 2015]

(2) $\cos 3\alpha$ =

(a) $4\cos^3\alpha - 3\cos\alpha$ (b) $3\cos\alpha - 4\cos^3$

(c) $3\cos\alpha + 4\cos^3\alpha$ (d) None of these

[Lahore Board 2005]

(3) $\sec x$ =

(a) $\sec(x + 2\pi)$ (b) $\sec(x + \pi)$

(c) $\cos x$ (d) $\sin x$

[Lahore Board 2005]

(4) $\sin P + \sin Q$ =

(a) $2 \sin \frac{P+Q}{2} \cos \frac{P-Q}{2}$ (b) $-2 \sin \frac{P+Q}{2} \cdot \sin \frac{P-Q}{2}$

(c) $2 \cos \frac{P+Q}{2} \cdot \cos \frac{P-Q}{2}$ (d) None of these

[Lahore Board 2005]

(5) $\cos(\alpha - \beta)$ =

(a) $\cos\alpha \cos\beta + \sin\alpha \sin\beta$ (b) $\cos\alpha \cos\beta - \sin\alpha \sin\beta$

(c) $\sin\alpha \cos\beta + \cos\alpha \sin\beta$ (d) $\sin\alpha \cos\beta - \cos\alpha \sin\beta$

[Gujranwala Board 2005]

(6) $\operatorname{cosec}(\pi - \alpha) =$

(a) $\sin\alpha$ (b) $\cos\alpha$

(c) $\cot\alpha$ (d) $\operatorname{cosec}\alpha$

[Gujranwala Board 2005]

(7) $1 + \cos 2\alpha =$

(a) $\cos^2\alpha$ (b) $2\cos^2\alpha$

(c) $\sin^2\alpha$ (d) $2\sin\alpha$

[Gujranwala Board 2005]

(8) $\cos\left(\frac{\pi}{2} - \beta\right) =$

(a) $\cos\beta$ (b) $\cos\frac{\pi}{2}$

(c) $\sin\beta$ (d) $-\sin\beta$

[Gujranwala Board 2005]

(9) $2\sin\alpha\cos\beta =$

(a) $\sin(\alpha + \beta) + \cos(\alpha - \beta)$ (b) $\sin(\alpha + \beta) + \sin(\alpha - \beta)$

(c) $\sin(\alpha + \beta) - \sin(\alpha - \beta)$ (d) None of these

[Gujranwala Board 2006]

(10) $\sec\left(\frac{3\pi}{2} - \theta\right) =$

(a) $\operatorname{cosec}\theta$ (b) $-\operatorname{cosec}\theta$

(c) $-\sec\theta$ (d) None of these

[Gujranwala Board 2006]

(11) $\pm\sqrt{\frac{1 + \cos\alpha}{2}} =$

(a) $\cos\frac{\alpha}{2}$ (b) $\sin\frac{\alpha}{2}$

(c) $\tan\frac{\alpha}{2}$ (d) None of these

[Gujranwala Board 2006]

(12) $\sin 3\alpha =$

(a) $3\sin\alpha + 4\sin^3\alpha$ (b) $4\sin\alpha + 3\sin^3\alpha$

(c) $3\sin\alpha - 4\sin^3\alpha$ (d) $3\sin\alpha + 4\sin^3\alpha$

[Lahore Board 2006]

[Gujranwala Board 2006]

(13) If $r\cos\theta = 3$, $r\sin\theta = 4$ then r is:

(a) 25 (b) -5

(c) 5 (d) -25

[Lahore Board 2006]

(14) $\tan(180° + \alpha)$ is equal to:

(a) $\tan\alpha$ (b) $-\tan\alpha$

(c) $\cot\alpha$ (d) $-\cot\alpha$

[Lahore Board 2006]

(15) $\cos2\theta$ is equal to:

(a) $\dfrac{1 - \tan^2\theta}{1 + \tan^2\theta}$ (b) $\dfrac{1 - \tan^2\theta}{1 - \tan^2\theta}$

(c) $\dfrac{2\tan\theta}{1 + \tan^2\theta}$ (d) $\dfrac{1 + \tan^2\theta}{2\tan\theta}$

[Gujranwala Board 2007]

(16) $\sin\theta$ =

(a) $2\sin\dfrac{\theta}{2}$ (b) $\sin\dfrac{\theta}{2} \cdot \cos\dfrac{\theta}{2}$

(c) $2\cos^2\dfrac{\theta}{2}$ (d) $2\sin\dfrac{\theta}{2} \cdot \cos\dfrac{\theta}{2}$

[Lahore Board 2007]

(17) co-ratio of cosine is:

(a) sec (b) sine

(c) cosec (d) cos

[Lahore Board 2008]

(18) $\tan2\alpha$ equals:

(a) $\dfrac{\tan\alpha}{1 - \tan^2\alpha}$ (b) $\dfrac{\tan2\alpha}{1 - \tan^2\alpha}$

(c) $\dfrac{2\tan\alpha}{1 - \tan^2\alpha}$ (d) $\dfrac{2\tan\alpha}{1 + \tan^2\alpha}$

[Gujranwala Board 2008]

(19) $\tan(270° + \theta)$ is equal to:

(a) $\cot\theta$ (b) $\tan\theta$

(c) $-\cot\theta$ (d) $-\tan\theta$

[Lahore Board 2014, Gujranwala Board 2009]

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(a) $\dfrac{\tan\alpha}{1 - \tan^2\alpha}$ (b) $\dfrac{\tan2\alpha}{1 - \tan^2\alpha}$

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[Gujranwala Board 2008]

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(a) $\cot\theta$ (b) $\tan\theta$

(c) $-\cot\theta$ (d) $-\tan\theta$

[Lahore Board 2014, Gujranwala Board 2009]

(20) $\tan\frac{\alpha}{2}$ is equal to:

(a) $\pm\sqrt{\frac{1-\cos\alpha}{1+\cos\alpha}}$ (b) $\sqrt{\frac{1+\cos\alpha}{1-\cos\alpha}}$

(c) $\pm\sqrt{\frac{1-\cos\alpha}{2}}$ (d) $\sqrt{\frac{1+\cos\alpha}{2}}$

[Gujranwala Board 2009]

(21) $\cos\left(\frac{\pi}{2}+\theta\right)$ equals:

(a) $\cos\theta$ (b) $-\sin\theta$

(c) $\sin\theta$ (d) $-\cos\theta$

[Lahore Board 2009]

(22) $2\sin12°\sin46°$ equals:

(a) $\cos34° + \cos58°$ (b) $\sin34° - \sin58°$

(c) $\sin34° + \sin58°$ (d) $\cos34° - \cos58°$

[Lahore Board 2009]

(23) $\sin\left(\frac{\pi}{2}-\theta\right)$ equals:

(a) $\cos\theta$ (b) $\sin\theta$

(c) $-\cos\theta$ (d) $-\sin\theta$

[Lahore Board 2009]

(24) $2\sin\alpha\cos\beta$ equals:

(a) $\sin(\alpha+\beta)-\sin(\alpha-\beta)$ (b) $\cos(\alpha+\beta)+\cos(\alpha-\beta)$

(c) $\sin(\alpha+\beta)+\sin(\alpha-\beta)$ (d) $\cos(\alpha+\beta)-\cos(\alpha-\beta)$

[Lahore Board 2009]

(25) $\sin\left(\frac{3\pi}{2}+\theta\right) =$

(a) $\cos\theta$ (b) $-\cos\theta$

(c) $\sin\theta$ (d) $-\sin\theta$

[Lahore Board 2010]

(26) $2\cos5\theta \cdot \sin3\theta =$

(a) $\sin8\theta - \sin2\theta$ (b) $\sin8\theta + \sin2\theta$

(c) $\cos8\theta + \cos2\theta$ (d) $\sin4\theta - \sin\theta$

[Lahore Board 2010]

(27) $\cos\frac{\alpha}{2}$ is equal to:

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

(c) $\frac{1+\sin\alpha}{2}$ (d) $\pm\sqrt{\frac{1+\cos\alpha}{2}}$

[Gujranwala Board 2010]

(28) $\tan2\alpha$ = _____

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

(c) $\frac{\tan\alpha}{1-\tan^2\alpha}$ (d) $\frac{\tan\alpha}{1+\tan^2\alpha}$

[Lahore Board 2012]

(29) $\cos(\pi-\theta)$ =

(a) $\sin\theta$ (b) $-\sin\theta$

(c) $\cos\theta$ (d) $-\cos\theta$

[Lahore Board 2012]

(30) $\cos(\pi-\theta)$ =

(a) $\sin\theta$ (b) $-\sin\theta$

(c) $\cos\theta$ (d) $-\cos\theta$

[Lahore Board 2013]

(31) $\sin(-300°)$ =

(a) $-\frac{\sqrt{3}}{2}$ (b) $\frac{\sqrt{3}}{2}$

(c) $\frac{2}{\sqrt{3}}$ (d) 0

[Lahore Board 2013]

(32) Distance between the points A(3, 8) and B(5, 6) is:

(a) $\sqrt{2}$ (b) $2\sqrt{2}$

(c) $\sqrt{3}$ (d) $3\sqrt{3}$

(33) Fundamental law of trigonometry is _____ where α, β are any two angles:

(a) $\cos(\alpha+\beta) = \cos\alpha\cos\beta - \sin\alpha\sin\beta$

(b) $\cos(\alpha-\beta) = \cos\alpha\cos\beta + \sin\alpha\sin\beta$

(c) $\sin(\alpha+\beta) = \sin\alpha\cos\beta + \cos\alpha\sin\beta$

(d) $\sin(\alpha-\beta) = \sin\alpha\cos\beta - \cos\alpha\sin\beta$

(34) $\cos\frac{\pi}{12}$ =

(a) $\frac{\sqrt{3}}{2}$ (b) $\frac{\sqrt{3}-1}{\sqrt{2}}$

(c) $\frac{\sqrt{3}+1}{\sqrt{2}}$ (d) $\frac{\sqrt{3}+1}{2\sqrt{2}}$

(35) $\sec(-300°)$ =

(a) 1 (b) -1

(c) 2 (d) -2

(36) If α, β, γ are angles of triangle then $\cos(\alpha+\beta)$ = ————

(a) $\cos\gamma$ (b) $-\cos\gamma$

(c) $\sin\gamma$ (d) $\sin\frac{\gamma}{2}$

(37) $\sin(\alpha+\beta) \cdot \sin(\alpha-\beta)$ =

(a) $\sin^2\alpha - \sin^2\beta$ (b) $\sin^2\alpha + \sin^2\beta$

(c) $\cos^2\alpha - \cos^2\beta$ (d) $\cos^2\alpha + \cos^2\beta$

(38) $\frac{\cos11° + \sin11°}{\cos11° - \sin11°}$ =

(a) $\tan 65°$ (b) $\tan 54°$

(c) $\tan 56°$ (d) $\tan 37°$

(39) $\frac{\sin A + \sin 2A}{1 + \cos A + \cos 2A}$ =

(a) $\sin A$ (b) $\cos A$

(c) $\cot A$ (d) $\tan A$

(40) $2\sin7\theta\cos3\theta$ =

(a) $\sin10\theta + \sin4\theta$ (b) $\sin10\theta - \sin4\theta$

(c) $\cos10\theta + \cos4\theta$ (d) $\cos10\theta - \cos4\theta$

(41) $\sin5x + \sin7x$ =

(a) $2\sin3x\cos x$ (b) $2\sin x\cos x$

(c) $2\sin x\cos6x$ (d) $2\sin6x\cos x$

(42) $\sin\left(\frac{\pi}{4}-\theta\right)\sin\left(\frac{\pi}{4}+\theta\right)$ =

(a) $\frac{1}{2}\cos2\theta$ (b) $\frac{1}{2}\sin2\theta$

(c) $\frac{1}{2}\sin\theta\cos\theta$ (d) $2\sin\theta \cdot \cos2\theta$

(43) If $x > y > 0$ then point P(x, y) lies in quadrant:

(a) I (b) II (c) III (d) IV

(44) $\tan\left(-\alpha + \frac{\pi}{2} - \beta\right) =$

(a) $\tan(\alpha + \beta)$ (b) $\tan(\alpha - \beta)$

(c) $\cot(\alpha + \beta)$ (d) $\cot(\alpha - \beta)$

(45) If $\cot\alpha + \cot\theta = 0$ then $\alpha = ?$

(a) $\frac{\pi}{2} - \theta$ (b) $\pi - \theta$

(c) $\pi + \theta$ (d) None of these

(46) If $\frac{2\cos\theta(1 - \cos^2\theta)}{\sin 2\theta} > 0$ and $\frac{\sec^2\theta - 1}{\tan^2\theta \cdot \cot\theta} < 0$ then 'θ' lies in the quadrant:

(a) I (b) II

(c) III (d) IV

(47) $\sec\theta \neq$

(a) $\frac{\sqrt{1 + \cot^2\theta}}{\cot\theta}$ (b) $\frac{1}{\sqrt{1 - \sin^2\theta}}$

(c) $\sqrt{\operatorname{cosec}^2\theta - 1}$ (d) $\frac{\operatorname{cosec}\theta}{\sqrt{\operatorname{cosec}^2\theta - 1}}$

(48) $\tan\frac{5\alpha}{2} =$

(a) $\pm\sqrt{\frac{1 - \cos 5\alpha}{1 + \cos 5\alpha}}$ (b) $\pm\sqrt{\frac{1 - \cos\frac{5\alpha}{2}}{1 + \cos\frac{5\alpha}{2}}}$

(c) $\pm\sqrt{\frac{1 + \cos 5\alpha}{1 - \cos 5\alpha}}$ (d) None of these

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

(a) $\sin\alpha\cos\beta$ (b) 0

(c) $\sin(\alpha - \beta) + \cos\alpha$ (d) $\cos\alpha \cdot \cos\beta$

(50) The value of $\cos 315°$ is:

(a) 0 (b) 1

(c) $\frac{\sqrt{3}}{2}$ (d) $\frac{1}{\sqrt{2}}$

(51) $\cos 2\alpha =$ ————

(a) $2\cos^2\alpha + 1$ (b) $2\cos^2\alpha - 1$

(c) $2\sin^2\alpha + 1$ (d) $2\sin^2 d - 1$

Answers

(1)	c	*(2)*	a	*(3)*	a	*(4)*	a	*(5)*	a
(6)	d	*(7)*	b	*(8)*	c	*(9)*	b	*(10)*	b
(11)	a	*(12)*	c	*(13)*	c	*(14)*	a	*(15)*	a
(16)	d	*(17)*	b	*(18)*	c	*(19)*	c	*(20)*	a
(21)	b	*(22)*	d	*(23)*	a	*(24)*	c	*(25)*	b
(26)	a	*(27)*	d	*(28)*	a	*(29)*	d	*(30)*	d
(31)	b	*(32)*	b	*(33)*	b	*(34)*	d	*(35)*	c
(36)	d	*(37)*	c	*(38)*	c	*(39)*	d	*(40)*	a
(41)	d	*(42)*	a	*(43)*	a	*(44)*	c	*(45)*	b
(46)	b	*(47)*	c	*(48)*	a	*(49)*	b	*(50)*	d
(51)	b								