

# Trigonometry

$$1. \sin \theta = \frac{\textit{Perpendicular}}{\textit{Hypotenuse}}$$

$$2. \cos \theta = \frac{\textit{Base}}{\textit{Hypotenuse}}$$

$$3. \tan \theta = \frac{\textit{Perpendicular}}{\textit{Base}}$$

$$4. \operatorname{cosec} \theta = \frac{1}{\sin \theta}$$

$$5. \sec \theta = \frac{1}{\cos \theta}$$

$$6. \cot \theta = \frac{1}{\tan \theta}$$

$$7. \tan \theta = \frac{\sin \theta}{\cos \theta}$$

$$8. \cot \theta = \frac{\cos \theta}{\sin \theta}$$

9. If in a circle of radius  $r$ , an arc of length  $l$  subtends an angle of  $\theta$  radians, then

$$10. l = r \theta$$

$$11. \text{Radian measure} = \pi / 180 \times \text{degree measure}$$

$$12. \text{Degree measure} = 180 / \pi \times \text{radian measure}$$

$$13. \cos^2 A + \sin^2 A = 1$$

$$14. 1 + \tan^2 A = \sec^2 A$$

$$15. 1 + \cot^2 A = \operatorname{cosec}^2 A$$

$$16. \cos(x + y) = \cos x \cos y - \sin x \sin y$$

$$17. \cos(x - y) = \cos x \cos y + \sin x \sin y$$

$$18. \sin(x + y) = \sin x \cos y + \cos x \sin y$$

$$19. \sin(x - y) = \sin x \cos y - \cos x \sin y$$

$$20. \cos x + \cos y = 2\cos\left(\frac{x+y}{2}\right)\cos\left(\frac{x-y}{2}\right)$$

$$21. \cos x - \cos y = -2\sin\left(\frac{x+y}{2}\right)\sin\left(\frac{x-y}{2}\right)$$

$$22. \sin x + \sin y = 2\sin\left(\frac{x+y}{2}\right)\cos\left(\frac{x-y}{2}\right)$$

$$23. \sin x - \sin y = 2\cos\left(\frac{x+y}{2}\right)\sin\left(\frac{x-y}{2}\right)$$

$$24. 2\cos x \cos y = \cos(x+y) + \cos(x-y)$$

$$25. -2\sin x \sin y = \cos(x+y) - \cos(x-y)$$

$$26. 2\sin x \cos y = \sin(x+y) + \sin(x-y)$$

$$27. 2\cos x \sin y = \sin(x+y) - \sin(x-y)$$

$$28. \tan(x+y) = \frac{(\tan x + \tan y)}{(1 - \tan x \cdot \tan y)}$$

$$29. \tan(x-y) = \frac{(\tan x - \tan y)}{(1 + \tan x \cdot \tan y)}$$

$$30. \cot(x+y) = \frac{(\cot x \cdot \cot y - 1)}{(\cot x + \cot y)}$$

$$31. \cot(x-y) = \frac{(\cot x \cdot \cot y + 1)}{(\cot x - \cot y)}$$

$$32. \cos 2x = \cos^2 x - \sin^2 x = 2\cos^2 x - 1 = 1 - 2\sin^2 x = \frac{(1 - \tan^2 x)}{(1 + \tan^2 x)}$$

$$33. \sin 2x = 2\sin x \cos x = \frac{2\tan x}{(1 + \tan^2 x)}$$

$$34. \tan 2x = \frac{2\tan x}{(1 - \tan^2 x)}$$

$$35. \sin 3x = 3\sin x - 4\sin^3 x$$

$$36. \cos 3x = 4\cos^3 x - 3\cos x$$

$$37. \tan 3x = \frac{(3\tan x - \tan^3 x)}{(1 - 3\tan^2 x)}$$

**TABLE:**

	<b>0°</b>	<b>30°</b>	<b>45°</b>	<b>60°</b>	<b>90°</b>
<b>Sin θ</b>	0	1/2	1/√2	√3/2	1
<b>Cos θ</b>	1	√3/2	1/√2	1/2	0
<b>Tan θ</b>	0	1/√3	1	√3	∞
<b>Cosec θ</b>	∞	2	√2	2/√3	1
<b>Sec θ</b>	1	2/√3	√2	2	∞
<b>Cot θ</b>	∞	√3	1	1/√3	0

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