

Important Identities in Trigonometry

$$1. \tan\theta = \frac{\sin\theta}{\cos\theta}$$

$$2. \cot\theta = \frac{\cos\theta}{\sin\theta}$$

$$3. \csc\theta = \frac{1}{\sin\theta}$$

$$4. \sec\theta = \frac{1}{\cos\theta}$$

$$5. \cos^2\theta + \sin^2\theta = 1$$

$$6. 1 + \tan^2\theta = \sec^2\theta$$

$$7. 1 + \cot^2\theta = \csc^2\theta$$

$$8. \cos(90 - \theta) = \sin\theta$$

$$9. \sin(90 - \theta) = \cos\theta$$

$$10. \tan(90 - \theta) = \cot\theta$$

$$11. \sin(A \pm B) = \sin A \cos B \pm \cos A \sin B$$

$$12. \cos(A \pm B) = \cos A \cos B \mp \sin A \sin B$$

$$13. \cos(2A) = \begin{cases} \cos^2 A - \sin^2 A \\ 1 - 2 \sin^2 A \\ 2 \cos^2 A - 1 \end{cases}$$

$$14. \sin(2A) = 2 \sin(A) \cos(A)$$

$$15. \text{Law of sines: } \frac{\sin A}{a} = \frac{\sin B}{b} = \frac{\sin C}{c}$$

$$16. \text{Law of cosines: } \begin{cases} a^2 = b^2 + c^2 - 2bc \cos A \\ b^2 = c^2 + a^2 - 2ca \cos B \\ c^2 = a^2 + b^2 - 2ab \cos C \end{cases}$$