

Important Trigonometry Identities

You are expected to have the following facts memorized.

$$1. \sin(x) = \frac{\text{opposite}}{\text{hypotenuse}}$$

$$2. \cos(x) = \frac{\text{adjacent}}{\text{hypotenuse}}$$

$$3. \tan(x) = \frac{\sin(x)}{\cos(x)} = \frac{\text{opposite}}{\text{adjacent}}$$

$$4. \sin(-x) = -\sin(x)$$

$$5. \cos(-x) = \cos(x)$$

$$6. \sin(x + y) = \sin(x)\cos(y) + \cos(x)\sin(y)$$

$$7. \cos(x + y) = \cos(x)\cos(y) - \sin(x)\sin(y)$$

$$8. \sec(x) = \frac{1}{\cos(x)} = \frac{\text{hypotenuse}}{\text{adjacent}}$$

$$9. \csc(x) = \frac{1}{\sin(x)} = \frac{\text{hypotenuse}}{\text{opposite}}$$

$$10. \cot(x) = \frac{1}{\tan(x)} = \frac{\text{adjacent}}{\text{opposite}}$$

$$11. \sin^2(x) + \cos^2(x) = 1$$

$$12. \tan^2(x) + 1 = \sec^2(x)$$

$$13. 1 + \cot^2(x) = \csc^2(x)$$

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

$$15. \cos(2x) = \cos^2(x) - \sin^2(x) = 2\cos^2(x) - 1 = 1 - 2\sin^2(x)$$

$$16. \cos^2(x) = \frac{1}{2}(1 + \cos 2x)$$

$$17. \sin^2(x) = \frac{1}{2}(1 - \cos(2x))$$

You should also know the graphs of the trigonometric functions as well as the values of the trigonometric functions for the angles $0, \frac{\pi}{6}, \frac{\pi}{4}, \frac{\pi}{3}, \frac{\pi}{2},$ and π . You can use reference angles to find the values of the trigonometric functions for the angles in the other 3 quadrants.