Practice Problems for Math Success

Trignometry Review

This problem set is designed to help you review key trigonometry concepts. Show all your work and provide clear explanations where necessary. You may use a calculator for basic arithmetic, but you should know the unit circle and be able to find exact values of trigonometric functions. Try to complete the problems without relying on external resources first, then check your answers or seek help if needed.

This review covers the following fundamental trigonometry topics:

- **Angles:** Degrees, radians, coterminal angles, complementary and supplementary angles.
- **Unit Circle:** Understanding the unit circle, finding trigonometric values for special angles.
- **Trigonometric Functions:** Sine, cosine, tangent, cosecant, secant, cotangent, and their relationships.
- **Right Triangle Trigonometry:** Solving right triangles using trigonometric ratios (SOH CAH TOA).

Angles

1. What is the complement of an angle measuring $35°$?

2. What is the supplement of an angle measuring $120°$?

3. Sketch an angle in standard position that measures $210°$. In which quadrant does the terminal side of this angle lie?

4. Find two coterminal angles (one positive and one negative) for an angle that measures $75°$.

Unit Circle

5. What are the coordinates of the point on the unit circle that corresponds to the angle $\frac{\pi}{3}$?

6. If $\sin(\theta) = \frac{1}{2}$ and θ is in Quadrant II, what is the value of $\cos(\theta)$?

7. Find the exact value of $\tan(\frac{5\pi}{6})$.

8. For what angle(s) in the interval $[0, 2\pi)$ does $\cos(\theta) = 0$?

Other Trigonometric Functions

9. If $\sin(\theta) = \frac{3}{5}$ and $\cos(\theta) = \frac{4}{5}$, find the values of $\tan(\theta)$, $\cot(\theta)$, $\sec(\theta)$, and $\csc(\theta)$.

10. Simplify the expression: $\cos(\theta)\csc(\theta)$.

11. Given that $\sec(\theta) = \frac{5}{3}$, find the value of $\cos(\theta)$.

Right Triangle Trigonometry

12. A right triangle has legs of length 5 and 12. Find the length of the hypotenuse.

13. In a right triangle, the angle opposite a side of length 7 is $30°$. What is the length of the hypotenuse?

14. A 20-foot ladder leans against a wall, making a $60°$ angle with the ground. How far is the base of the ladder from the wall?

Mixed Problems

15. Find the exact values of $\sin(45°)$ and $\cos(45°)$.

16. If $\tan(\theta) = -1$ and θ is in Quadrant IV, find the values of $\sin(\theta)$ and $\cos(\theta)$.

17. A person standing 100 feet from the base of a tree observes that the angle of elevation to the top of the tree is $45°$. How tall is the tree?

18. A hot air balloon is rising vertically. From a point on the ground 100 meters away from the balloon's takeoff point, the angle of elevation to the balloon is 60°. How high is the balloon?

19. A boat travels 50 miles due north, then turns and travels 30 miles due east. How far is the boat from its starting point?

20. Solve the equation $2\sin(x) - 1 = 0$ for x in the interval $[0, 2\pi)$.