

Name: _____

Score: _____

Show your work to receive credit for your answers.

1. For the function $y = -3\sin(2x)$,

- a. determine the amplitude,

- b. determine the period, and

- c. sketch the graph over two full periods.

2. Sketch the graph of $y = \csc(x)$ over two full periods.

3. Evaluate the following expression without a calculator: $\arcsin \frac{\sqrt{3}}{2}$.

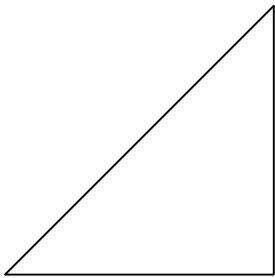
4. Evaluate each expression without a calculator (find exact values).

a. $\arccos\left(\cos\frac{p}{4}\right)$

b. $\arcsin\left(\sin\frac{2p}{3}\right)$

c. $\cos\left(\arctan\frac{3}{4}\right)$

5. Use an inverse trigonometric function to write θ as a function of x , where θ and x are as indicated in the following right triangle.



6. Write an algebraic expression that is equivalent to $\sin(\arccos 3x)$.

[Hint: sketch a right triangle]

7. The length of a shadow of a tree is 100 feet when the angle of elevation of the sun is 32° . Approximate the height of the tree.

8. An airplane flying at 500 miles per hour has a bearing of $N 43^\circ W$. After flying 2 hours, how far north and how far west will the plane have traveled from its point of departure?

9. Given that $\csc q = \frac{5}{3}$ and $\tan q = \frac{3}{4}$, evaluate the other four trigonometric functions.

10. Using trigonometric identities, simplify the following expression:

$$\csc^2 x (1 - \cos^2 x)$$

11. Factor the following expression and use identities to simplify:

$$\sin^2 x \tan^2 x + \sin^2 x$$

12. Verify each identity:

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

b. $\cos^3 x \sin^2 x = (\sin^2 x - \sin^4 x)\cos x$

c. $\frac{1}{\sin x} - \sin x = \frac{\cos^2 x}{\sin x}$

13. Solve the equation $2 \sin^2 2x = 1$.

13. Find all solutions of the following equation in the interval $[0, 2\pi)$:

$$\cot x \cos^2 x = 2 \cot x.$$