

Chapter 7 Review Extra Practice

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1. Write each of the following expressions as a single trigonometric function.

a) $\sin 16^\circ \cos 99^\circ - \cos 16^\circ \sin 99^\circ$

b)
$$\frac{\tan \frac{\pi}{18} + \tan \frac{2\pi}{9}}{1 - \tan \frac{\pi}{18} \tan \frac{2\pi}{9}}$$

c) $\sin \frac{13\pi}{20} \cos \frac{\pi}{5} + \cos \frac{13\pi}{20} \sin \frac{\pi}{5}$

d) $\cos 88^\circ \cos 9^\circ - \sin 88^\circ \sin 9^\circ$

e)
$$\frac{\tan 61^\circ - \tan 49^\circ}{1 + \tan 61^\circ \tan 49^\circ}$$

f) $\cos \frac{4\pi}{11} \cos \frac{4\pi}{5} + \sin \frac{4\pi}{11} \sin \frac{4\pi}{5}$

2. Write each of the following expressions as a single trigonometric function.

a)
$$\frac{2 \tan 114^\circ}{1 - \tan^2 114^\circ}$$

b) $1 - 2 \sin^2 \frac{3\pi}{22}$

c) $2 \cos^2 \frac{19\pi}{25} - 1$

d) $\cos^2 77^\circ - \sin^2 77^\circ$

e) $2 \sin 159^\circ \cos 159^\circ$

f)
$$\frac{2 \tan \frac{3\pi}{41}}{1 - \tan^2 \frac{3\pi}{41}}$$

3. Give a counterexample to show that each of the following statements is not an identity.

a) $\cos 2x = \frac{2 \cos x}{1 - \cos^2 x}$

b) $\sin^3 x + \cos^3 x = 1$

c) $\cot x = \frac{\sec x}{\csc x}$

d) $\cot(x - y) = \cot x - \cot y$

4. Determine the solutions for each equation where $0 \leq x \leq 2\pi$.

a) $1 + \frac{17}{3} \tan x = -\frac{14}{3}$

b) $\sin x + 2 + \frac{\csc x}{10} = \frac{9}{5} + \sin x$

c) $5 + \pi + 2 \cos x = \pi + 4$

d) $\sqrt{3} + 4 \cot x - 1 = 2\sqrt{3} - 1 + \cot x$

e) $\frac{\sin x + \cos x}{15} = 0$

f) $\frac{1 + 9 \sec x + \pi}{\sec x} = \frac{17}{2} + \frac{\pi}{\sec x}$

5. With the help of a graphing calculator, sketch a graph that could be used to help solve each of the following equations. Also state the solution(s) to the equations, where $0 \leq x \leq 2\pi$.

a) $\sin x = \frac{1}{2}$

b) $\frac{\cot x}{8} = -\frac{\sqrt{3}}{24}$

c) $20 \csc x + 40 = 0$

6. Use factoring to solve each of the following equations where $0 \leq x \leq 2\pi$. Round your answers to two decimal places, if necessary.

a) $36 \sin^2 x + 5 \sin x - 1 = 0$

b) $\sec^2 x + \frac{17}{7} \sec x + \frac{10}{7} = 0$

7. Use the quadratic formula to solve each of the following equations where $0 \leq x \leq 2\pi$. Round your answers to two decimal places, if necessary.

a) $0.3 \csc^2 x + 0.1 \csc x - 0.9 = 0$

b) $0.9 \tan^2 x + 0.6 \tan x - 0.1 = 0$