7-1 Worksheet: Basic Trig Identities

Use the given information to determine the exact trigonometric value if $0^0 < \theta < 90^0$

1). $\cos \theta = \dfrac{1}{4}$, find $\tan \theta$

2). If $\sin \theta = \dfrac{2}{3}$, find $\cos \theta$

4). If $\tan \theta = 2$, find $\cot \theta$

3). If $\tan \theta = \dfrac{7}{2}$, find $\sin \theta$

Express each value as a trigonometric function of an angle in Quadrant I.

5). cos 892°

6). csc 495°

7). sin $\dfrac{23\pi}{3}$

Simplify each expression.

8). $\cos x + \sin x \tan x$

9). $\dfrac{\cot A}{\tan A}$

7-2 Worksheet: Proving Trig Identities

Verify that each equation is an identity and state the domain of the identity.

1). $\dfrac{\csc x}{\cot x + \tan x} = \cos x$

2). $\dfrac{1}{\sin x - 1} - \dfrac{1}{\sin x + 1} = -2\sec^2 x$

3). $\sin^3 x - \cos^3 x = (1 + \sin x \cos x)(\sin x - \cos x)$

4). $\tan x + \dfrac{\cos x}{1 + \sin x} = \sec x$

Find a numerical value of one trigonometric function of x.

5). $\sin x \cot x = 1$ 6). $\sin x = 3\cos x$ 7). $\cos x = \cot x$

7-3 Worksheet: Sum and Difference Identities

Use the sum and difference identities to find the exact value of each trig function.

1). $\cos \dfrac{5\pi}{12}$

2). $\sin(-165^{0})$

3). $\tan(-\dfrac{7\pi}{12})$

4). $\sec \dfrac{\pi}{12}$

Find each exact value if $0 < y < \dfrac{\pi}{2}$, $\dfrac{\pi}{2} < x < \pi$

5). $\cos(x+y)$ if $\sin x = \dfrac{3}{5}$, $\sin y = \dfrac{2}{7}$

6). $\sin(x-y)$ if $\cos x = -\dfrac{8}{17}$ and $\cos y = \dfrac{3}{5}$

Verify that each equation is an identity.

7). $\cos(180^0 - \theta) = -\cos\theta$

8). $\sin(360^0 + \theta) = \sin\theta$

7-4 Worksheet: Double-Angle Identities

Use the given information to find sin2x, cos2x

1). $\sin x = \dfrac{12}{13}$, for $0 < x < 90$

2). $\sec x = -\dfrac{5}{2}$, for $\dfrac{\pi}{2} < x < \pi$

Use the given information to find sin2x, cos2x

3). $\sin x = \dfrac{3}{5}$, for $0 < x < \dfrac{\pi}{2}$

Verify that each equation is an identity.

4). $1 + \sin 2x = (\sin x + \cos x)^2$

5). $\cos x \sin x = \dfrac{\sin 2x}{2}$

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7-5 Worksheet: Solving Trigonometric Equations

Solve each equation for principal values of x. Express solutions in degrees.

1). $\cos x = 3\cos x - 2$

2). $2\sin^2 x - 1 = 0$

Solve each equation for $0 \le x < 360$

3). $\sin^2 x - 2\sin x + 1 = 0$

4). $\cos 2x + 3\cos x - 1 = 0$

Solve each equation for $0 \le x < 2\pi$

5). $4\sin^2 x - 4\sin x + 1 = 0$

6). $\cos 2x + \sin x = 1$

Solve each equation for all real values of x.

7). $3\cos 2x - 5\cos x = 1$

8). $2\sin^2 x - 5\sin x + 2 = 0$

9). $3\sec^2 x - 4 = 0$

10). $\tan x(\tan x - 1) = 0$

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Chapter 7 review Part 1

1. Given $\frac{3\pi}{2} \leq x \leq 2\pi$ and $\cos x = \frac{5}{8}$ find the following:

a. $\sin x =$ b. $\csc x =$

c. $\tan x =$ d. $\sec x =$

e. $\cot x =$

2. Given $90° \le x \le 180°$ and $\tan x = \dfrac{-5}{3}$ find the following:

a. $\cos 2x =$

b. $\sin 2x =$

3. Given: $\dfrac{\pi}{2} \le x \le \pi$ and $\sin x = \dfrac{1}{5}$. Given: $\dfrac{3\pi}{2} \le y \le 2\pi$ and $\cos y = \dfrac{6}{7}$.

a. Find $\cos(x - y)$

b. Find $\sin(x + y)$

4. Find $\sin(255°)$

5. Find $\cos\left(\dfrac{7\pi}{12}\right)$

6. Find $\cos\left(\dfrac{3\pi}{8}\right)$

7. $\sin(105°)$

8. $\sin\left(\dfrac{\pi}{12}\right)$ **SKIP**

Advanced Math

Chapter 7 review Part 2

Solve each equation for principal values of x.

1. $2 \sin x + 1 = 0$

2. $2\cos^2 x + 3\cos x = 2$

Solve each equation for the interval $0 \le x \le 2\pi$.

3. $4\sin^2 x + 1 = -4\sin x$

4. $\cos x \, \tan x - 2 \cos^2 x = -1$

Solve each equation where the Domain of x is all real #'s.

5. $3\cos^2 x = 6\cos x - 3$

6. $4 \sin^2 x - 2 = 0$

Verify that the following trigonometric expressions are identities. State the domain restrictions if any.

1. $\dfrac{\cos x}{\sec x} + \dfrac{\sin x}{\csc x} = \sec^2 x - \tan^2 x$

Domain:

2. $\dfrac{1}{1-\cos x} + \dfrac{1}{1+\cos x} = 2\csc^2 x$

Domain:

3. $\dfrac{\sin q}{\csc q} + \dfrac{\cos q}{\sec q} = \sin q \csc q$

Domain:

4. $\dfrac{\tan^2 q}{1 + \tan^2 q} = \sin^2 q$

Domain:

Solve the following inequalities. Domain $0 \leq x \leq 2\pi$. Hint... Draw the circle and the cosine or sine wave ☺.

1. $\cos x \leq \dfrac{-\sqrt{3}}{2}$

2. $\cos x - \dfrac{1}{2} > 0$

3. $\sqrt{2} \sin x - 1 < 0$