

For Problem 1-6, use:

$(-7, 24)$  is on the terminal side of  $A$  and  
 $90^\circ \leq A \leq 180^\circ$

$\cos B = \frac{4}{5}$  and  $0^\circ \leq B \leq 90^\circ$ ; and

$\cot C = \frac{12}{5}$  and  $-180^\circ \leq C \leq -90^\circ$

to find the exact values of:

1.  $\sin(A-B)$

4.  $\csc(A+B)$

2.  $\tan(2C)$

5.  $\sec(2B)$

3.  $\cos\left(\frac{1}{2}A\right)$

6.  $\tan\left(\frac{1}{2}C\right)$

7. Prove:  $\frac{\tan^2 w - \sec w - 5}{\tan^2 w + 3\sec w + 3} = \frac{\sec w - 3}{\sec w + 1}$

9. Solve exactly for  $x \in [0^\circ, 360^\circ)$ :  
 $\sin \theta = \sin 2\theta$

8. Prove:  $\cos\left(\frac{5\pi}{4} - x\right) = -\frac{\sqrt{2}}{2}(\cos x + \sin x)$

10. Solve exactly for x:  
 $2\left(\cot \frac{1}{2}x\right)(1 - \cos x) \frac{\csc x}{\sec x} = \sqrt{3}$

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to find the exact values of:

1.  $\cos(A-B)$

4.  $\tan(A+B)$

2.  $\sin 2B$

5.  $\cot 2A$

3.  $\sec\left(\frac{1}{2}B\right)$

6.  $\csc\left(\frac{1}{2}C\right)$

7. Prove:  $\cos\left(x + \frac{\pi}{2}\right)\sin(x + \pi) = 1 - \cos^2 x$

9. Prove:  $\csc(2x) = \frac{\csc x}{2 \cos x}$

8. Solve for  $x \in \left[-\frac{\pi}{4}, \frac{\pi}{4}\right)$ :

$$\tan^4 x - 4 \tan^2 x + 3 = 0$$

10. Solve for  $x$ :  $2 \cos^2\left(\frac{1}{2}x\right) - 2 = 2 \cos x$

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to find the exact values of:

1.  $\tan(A-B)$

4.  $\cos(A+C)$

2.  $\cot 2B$

5.  $\csc 2C$

3.  $\sin\left(\frac{1}{2}B\right)$

6.  $\sec\left(\frac{1}{2}A\right)$

7. Prove:

$$\frac{\sin 4x}{4(\cos x + \sin x)} = \sin x \cos^2 x - \cos x \sin^2 x$$

9. Solve exactly for  $x$ :

$$\tan x + \tan 2x = 1 - \tan x \tan 2x$$

8. Prove:  $\sec^2 \frac{\theta}{2} = \frac{2 \tan \theta}{\tan \theta + \sin \theta}$

10. Solve exactly for  $x \in [0, 60^\circ]$ :

$$\frac{\cos x \cos 20^\circ - \sin x \sin 20^\circ}{\sin x \cos 20^\circ + \cos x \sin 20^\circ} = \sqrt{3}$$

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to find the exact values of:

1.  $\csc(A-B)$

4.  $\sin(B+C)$

2.  $\sec 2A$

5.  $\cos 2C$

3.  $\cot\left(\frac{1}{2}A\right)$

6.  $\sin\left(\frac{1}{2}C\right)$

7. Prove:  $\frac{2\cos^2\left(\frac{1}{2}x\right)}{\sin x} = \csc x + \cot x$

9. Prove:  $\frac{\sin x}{\csc x} + \frac{\cos x}{\sec x} = 1$

8. Solve for  $\theta$ :  $2\csc^2 \theta + 5\cot \theta = 0$

10. Solve for  $\theta \in [0^\circ, 360^\circ]$ :  $\cos \theta \sin \theta = \frac{\sqrt{3}}{4}$