

1. Find the value of the other five trigonometric functions given

a. $\tan u = \frac{24}{7}$, $\sin u < 0$.

b. $\sec u = -3$, $\pi/2 < u < \pi$

2. Simplify the following:

a. $\cot x \cdot \tan x$

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

c. $\frac{1 + \sin \theta}{\cos \theta} + \frac{\cos \theta}{1 + \sin \theta}$

3. Verify the identity:

a. $\cos \alpha \csc \alpha = \cot \alpha$

c. $(\csc x + 1)(\csc x - 1) = \cot^2 x$

b. $\sin(\pi - \theta) - \cos\left(\frac{\pi}{2} + \theta\right) = 2 \sin \theta$

d. $\sin 3x = 3 \sin x - 4 \sin^3 x$

4. Solve the equation over the given interval:

a. $2 \cos x = -1$ on $(-\infty, \infty)$.

c. $\tan^2 u - 6 \tan u + 4 = 0$ on $[0, 2\pi)$.

b. $4 \sin^2 x = 3$ on $[0, \pi]$.

d. $\sin 2x = \cos x$ on $[0, 2\pi)$.

5. Use an addition formula to find the exact value of $\tan 15^\circ$.

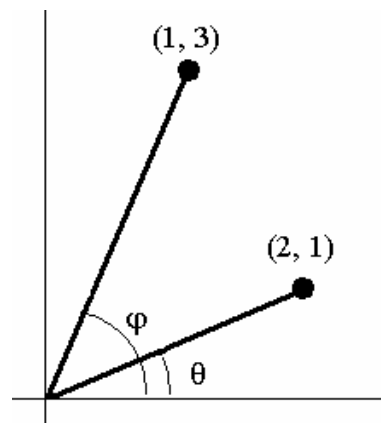
6. Use an addition formula to find the exact value of $\cos \frac{13\pi}{12}$.

7. Use a half angle formula to find the exact value of $\tan \frac{5\pi}{12}$.

8. Use a half angle formula to find the exact value of $\sin 22.5^\circ$.

9. Use a double angle formula to find the exact value of $\cos 2x$ if $\cos x = 0.6$.

10. Use the figure at right to find the exact values of $\sin 2\theta$, $\cos 2\theta$, and $\tan 2\theta$.



11. Use the figure at right to find the exact values of $\sin(\phi - \theta)$, $\cos(\theta + \phi)$ and $\tan(\theta - \phi)$.

12. Explain why algebra cannot solve an equation like $\cos x - x = 0$. Then solve the equation. Round your answer to three decimal places.

13. Verify the product to sum identity $\frac{\sin(x + y) + \sin(x - y)}{2} = \sin x \cos y$