

1. Determine the exact values of the following.

a) $\cot 30^\circ$

b) $\sec \frac{37\pi}{6}$

c) $\frac{\tan 45^\circ}{\csc 60^\circ}$

d) $\tan \frac{-33\pi}{4}$

e) $\sin \frac{67\pi}{3}$

f) $\csc \left(-\frac{113\pi}{3} \right)$

2. In which quadrant would you find ...

a) $P(-1200^\circ)$

b) $-\frac{73\pi}{11}$

c) $\frac{93\pi}{17}$

d) 492°

c) $P\left(\frac{28\pi}{5}\right)$

d) 2.5 rad

3. If $P(\theta) = \left(-\frac{5}{7}, \frac{2\sqrt{6}}{7} \right)$, determine the exact values of ...

a) $\sec \theta$

b) $\cot \theta$

c) $\cos \theta$

4. Find the coterminal angle within the restriction $0 \leq \theta \leq 2\pi$ that corresponds to ...

a) 480°

b) $\frac{-17\pi}{6}$

c) $\frac{115\pi}{4}$

d) $-\frac{39\pi}{2}$

e) $\frac{61\pi}{3}$

d) -513°

5. Given $\csc x = 2.366$, determine ...

a) $\sin x$

b) $\cot x$

6. Determine the area of the circle whose arc length is 30cm and central angle $\theta = \frac{3\pi}{8}$.

7. Determine the value of x , if ...

a) $\sec 40^\circ = \frac{x}{3}$

b) $\frac{\cos x}{\sin x} = 2.5$

c) $\csc 51^\circ = x$

8. Given $\cos \theta = -\frac{3}{5}$, determine the possible value(s) of $\tan \theta$, if $\frac{\pi}{2} \leq \theta \leq \frac{3\pi}{2}$.

9. Given a trig point $P(\theta) = \left(\frac{m}{n}, -\frac{4}{5} \right)$, determine the exact value of $\cot \theta$.

10. Determine the coordinates of the following trigonometric points (exact values where possible).

a) $P\left(\frac{\pi}{5}\right)$

b) $P\left(\frac{29\pi}{4}\right)$

c) $P(122^\circ)$

d) $P\left(-\frac{83\pi}{3}\right)$

e) $P\left(\frac{107\pi}{6}\right)$

f) $P\left(\frac{119\pi}{7}\right)$

11. Eleanor rode the carousel at a fair. The radius of the circular path she traveled was $2.1m$. Eleanor's speed was 1.5 m/s and the ride lasted for $2\frac{1}{2}$ minutes. What is the measure of the central angle that corresponds to Eleanor's ride....

a) in radians?

b) in degrees?

12. Prove the following trigonometric identities

a) $\sin^4 \theta - \cos^4 \theta = 2\sin^2 \theta - 1$

f) $(1 + \tan^2 \theta)(1 - \cos^2 \theta) = \sec^2 \theta - 1$

b) $\frac{\cot^2 x}{1 + \frac{1}{\tan^2 x}} = \cos^2 x$

g) $\frac{\cos^2 \alpha}{1 - \sin \alpha} = 1 + \sin \alpha$

c) $\frac{\sec^2 \varphi - 1}{1 + \cot^2 \varphi} * \frac{\csc^2 \varphi}{\tan \varphi} * \csc \varphi = \sec \varphi$

h) $\frac{\sec^2 \theta \cot \theta}{\csc^2 \theta} = \tan \theta$

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

i) $\sin^4 x - \cos^4 x = 1 - 2\cos^2 x$

e) $\sin^2 \varphi (1 + \cot^2 \varphi) + \cos^2 \varphi (1 + \tan^2 \varphi) = 2$

j) $\csc^2 \alpha - \cot^2 \alpha = 1$

13. Solve the following trigonometric equations.

a) $\tan x = \sec x$

d) $\sin^2 \sigma = 3\cos^2 \sigma$

b) $\cos \delta + 2 = 3\cos \delta$

e) $3\cot \beta + 5\sec \beta = 4$

c) $2\sin \alpha \cos \alpha = \sqrt{2} \cos \alpha$

f) $\sec^2 x + 3\tan x - 11 = 0$