

1) Convert the degree measure to radian measure, in terms of π . Show work.

a) 480°

$$\frac{480}{180} = \frac{x}{\pi}$$

$$\frac{480\pi}{180} = \frac{180x}{180}$$

$$x = \frac{8\pi}{3} \text{ rad}$$

b) 700°

$$\frac{700}{180} = \frac{x}{\pi}$$

$$\frac{180x}{180} = \frac{700\pi}{180}$$

$$x = \frac{35\pi}{9} \text{ Rad}$$

2) Convert the radian measure into degree measure. Show work.

a) $\frac{13\pi}{6}$

$$\frac{13(180)}{6} = 390^\circ$$

$$\frac{13\pi}{6} = \frac{x}{180}$$

$$\frac{(13\pi/6)(180)}{\pi} = \frac{\pi x}{\pi}$$

$$x = 390^\circ$$

b) $\frac{\pi}{7}$

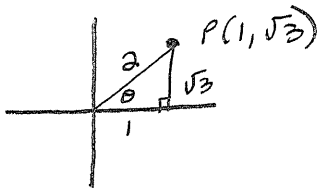
$$\frac{180}{7} = 25.7^\circ$$

$$\frac{\pi}{7} = \frac{x}{180}$$

$$\frac{(\pi/7)(180)}{\pi} = \frac{\pi x}{\pi}$$

$$x = 25.7^\circ$$

3) Find the EXACT value of the six trig functions if the terminal side of θ contains $P(1, \sqrt{3})$.



$$\sin \theta = \frac{\sqrt{3}}{2}$$

$$\csc \theta = \frac{2 \cdot \sqrt{3}}{\sqrt{3} \cdot \sqrt{3}} = \frac{2\sqrt{3}}{3}$$

$$\cos \theta = \frac{1}{2}$$

$$\sec \theta = \frac{2}{1} = 2$$

$$\tan \theta = \frac{\sqrt{3}}{1} = \sqrt{3}$$

$$\cot \theta = \frac{1 \cdot \sqrt{3}}{\sqrt{3} \cdot \sqrt{3}} = \frac{\sqrt{3}}{3}$$

4) In a circle of radius 12 cm and central angle 3.57 radians, find the following:

a) Length of arc

$$\frac{3.57}{2\pi} = \frac{x}{2\pi(12)}$$

$$\frac{3.57(2\pi)(12)}{2\pi} = \frac{2\pi x}{2\pi}$$

$$x = 42.84 \text{ cm}$$

$$x = 43 \text{ cm}$$

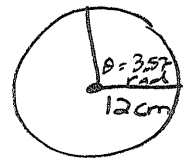
b) Area of sector

$$\frac{3.57}{2\pi} = \frac{x}{\pi(12)^2}$$

$$\frac{3.57(\pi)(12)^2}{2\pi} = \frac{2\pi x}{2\pi}$$

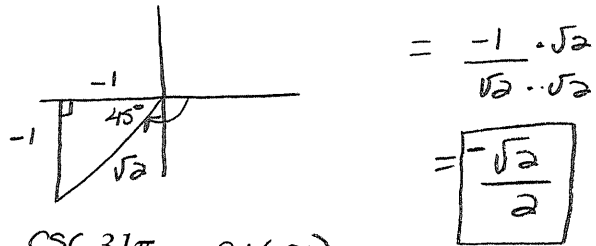
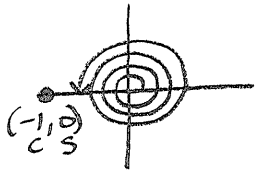
$$x = 257.64$$

$$x = 260 \text{ cm}^2$$



5) Find the EXACT value of each without using a calculator. Be sure to sketch the reference triangle and find the reference angle.

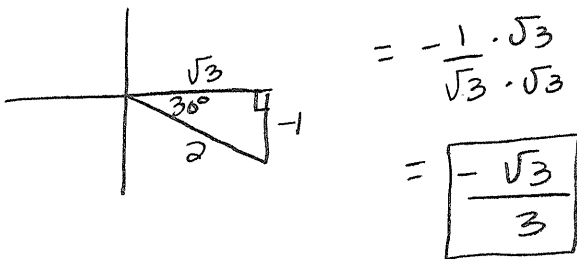
a) $\cot 7\pi = \frac{\cos}{\sin} = \frac{-1}{0} = \text{undefined}$ b) $\sin -\frac{3\pi}{4} = \frac{3(180)}{4} = -135^\circ$



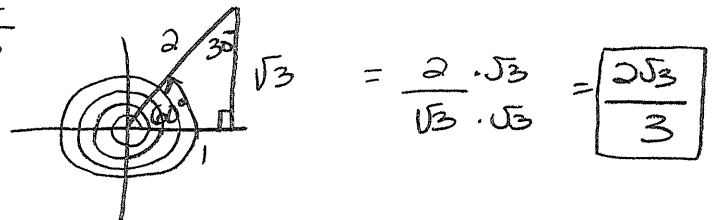
$$= \frac{-1 \cdot \sqrt{2}}{\sqrt{2} \cdot \sqrt{2}} = \frac{-\sqrt{2}}{2}$$

c) $\tan -\frac{\pi}{6} = \frac{-180}{6} = -30^\circ$

d) $\csc \frac{31\pi}{3} = \frac{31(180)}{3} = 1860^\circ$
 $\frac{4}{6}$



$$= \frac{-1 \cdot \sqrt{3}}{\sqrt{3} \cdot \sqrt{3}} = \frac{-\sqrt{3}}{3}$$



$$= \frac{2 \cdot \sqrt{3}}{\sqrt{3} \cdot \sqrt{3}} = \frac{2\sqrt{3}}{3}$$

6) Simplify the following expression using the fundamental identities.

a) $\frac{1 - \sin^2 x}{\cos^3 x}$

b) $\cot x \cdot \sin x$

c) $\sec x \cdot \cos^2 x$

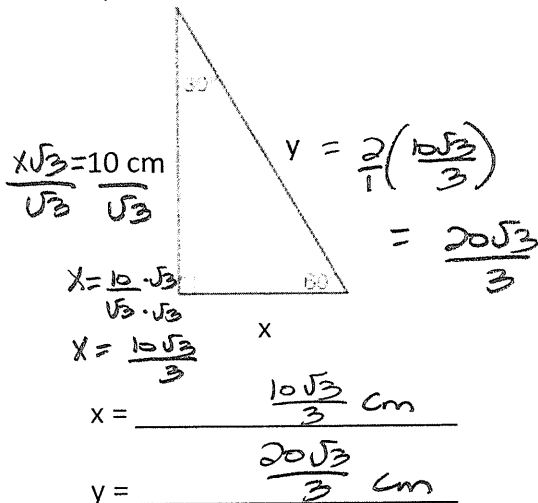
$$\frac{\cos^2 x}{\cos^3 x} = \frac{\cos x \cdot \cancel{\cos x}}{\cos x \cdot \cancel{\cos x} \cdot \cos x} = \frac{1}{\cos x} = \sec x$$

$$\frac{\cancel{\cos x}}{\cancel{\sin x}} = \cos x$$

$$\frac{1}{\cancel{\cos x}} \cdot \cancel{\cos x} \cdot \cos x = \cos x$$

7) Find the EXACT value of x and y in each of the following triangles.

a)



b)

