

$$y = \tan x$$

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

$$0 \quad \frac{\sin 0}{\cos 0} = \frac{0}{1} = 0$$

$$\frac{\pi}{4} \quad \frac{\sin \frac{\pi}{4}}{\cos \frac{\pi}{4}} = \frac{\frac{\sqrt{2}}{2}}{\frac{\sqrt{2}}{2}} = 1$$

$$\frac{\pi}{2} \quad \frac{\sin \frac{\pi}{2}}{\cos \frac{\pi}{2}} = \frac{1}{0} = \text{undef}$$

$$\frac{3\pi}{4} \quad \frac{\sin \frac{3\pi}{4}}{\cos \frac{3\pi}{4}} = \frac{\frac{\sqrt{2}}{2}}{-\frac{\sqrt{2}}{2}} = -1$$

$$\pi \quad \frac{\sin \pi}{\cos \pi} = \frac{0}{-1} = 0$$

$$\frac{5\pi}{4} \quad \frac{\sin \frac{5\pi}{4}}{\cos \frac{5\pi}{4}} = \frac{-\frac{\sqrt{2}}{2}}{-\frac{\sqrt{2}}{2}} = 1$$

$$\frac{3\pi}{2} \quad \frac{\sin \frac{3\pi}{2}}{\cos \frac{3\pi}{2}} = \frac{-1}{0} = \text{undef}$$

Calculus & Trigonometry

Chapter 4 & 5 Pre-Test

1.) (10 pts total, 5 pts each) Find the measure of the indicated arc or angle.

a) Find $m\angle BAC$

$r = 12$

$$\frac{\theta}{360} = \frac{\text{arc length}}{2\pi r}$$

$$\frac{\theta}{360} = \frac{2}{24\pi}$$

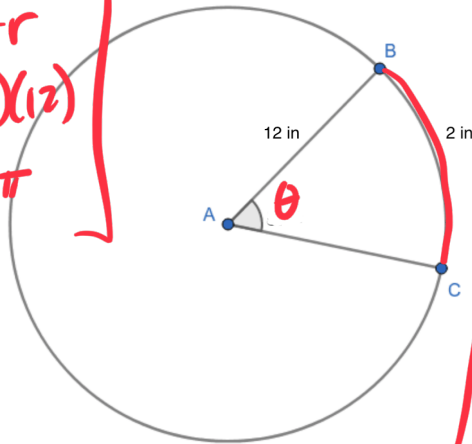
$$\frac{24\pi\theta}{24\pi} = \frac{720}{24\pi}$$

$$\theta = \frac{30}{\pi}$$

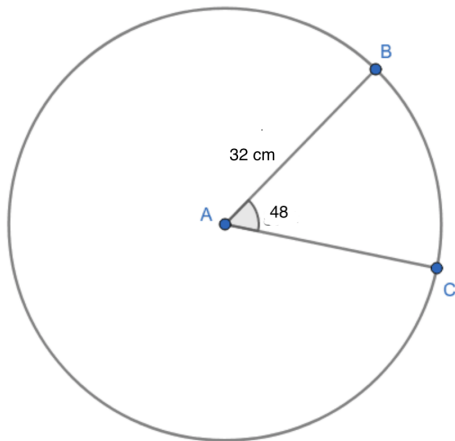
$$C = 2\pi r$$

$$(2\pi)(12)$$

$$24\pi$$



b) Find arc BC



Reduced

2.) (10 pts total, 2.5 pts each) Convert each angle measure as indicated.

a) $225^\circ = \frac{5\pi}{4} \pi$ $225^\circ * \frac{\pi}{180^\circ} = \frac{\pi}{180} \text{ or } \frac{180}{\pi}$

b) $7\pi/6 = \underline{210^\circ}$ $\left[\frac{225\pi}{180} \right] \div 45 = \frac{5\pi}{4}$

c) $580^\circ = \underline{\hspace{2cm}}$

$\frac{7\pi}{6} * \frac{180}{\pi} = 210$

d) $11\pi/4 = \underline{\hspace{2cm}}^\circ$

3.) (10 pts total, 2 pts each) Provide each of the indicated trigonometric ratios.

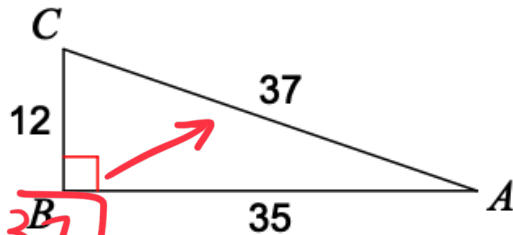
a) $\cos A = \frac{\text{adj}}{\text{hyp}} = \frac{35}{37}$

b) $\sec C$

c) $\csc A = \frac{1}{\sin A} = \frac{\text{hyp}}{\text{opp}} = \frac{37}{12}$

d) $\tan C$

e) $\sin C$



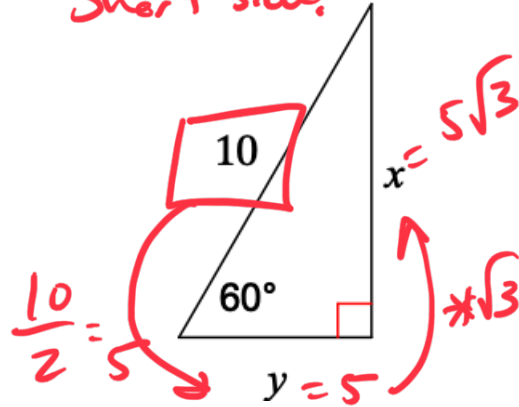
4.) (10 pts total, 2.5 pts each) Solve using special triangles. Please express your answer in radical form.

a)

$x = 5\sqrt{3}$

$y = 5$

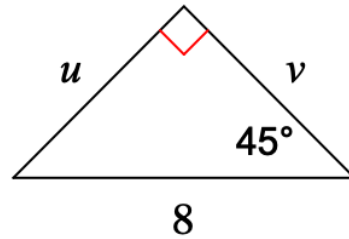
30-60-90 find the short side.



b)

$u =$

$v =$



NO CALCULATOR

5.) (20 pts total, 2 pts each) Provide the value of each. Express in radical form if applicable.

a) $\cos 120^\circ$ $-\frac{1}{2}$

b) $\sin 5\pi/6$ $\frac{1}{2}$

c) $\tan 7\pi/4$ -1

d) $\cos 11\pi/6$

e) $\csc 270^\circ$ -1
 $\frac{1}{\sin}$

f) $\sec 3\pi/4$ $\frac{1}{\cos 3\pi/4} = \frac{1}{-\frac{\sqrt{2}}{2}}$

g) $\sin 315^\circ$

h) $\cot 30^\circ$

$+1, 0,$
 $+\frac{\sqrt{2}}{2}$
 $+\frac{1}{2}$
 $+\frac{\sqrt{3}}{2}$

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



i) $\sec 4\pi/3$

j) $\cot \pi/2$

6.) (10 pts total, 2.5 pts each) Solve for the indicated variable.

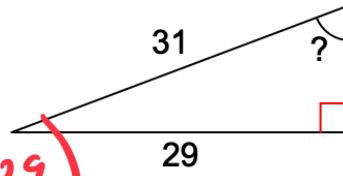
TELE Functions

a) $\sin^{-1} \left[\sin \theta \right] \left[\frac{29}{31} \right]$

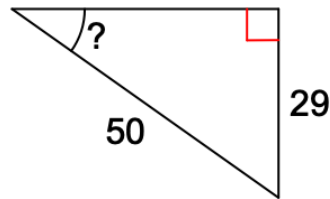
$\sin \theta = \frac{\text{opp}}{\text{hyp}}$

$\theta = \sin^{-1} \left(\frac{29}{31} \right)$

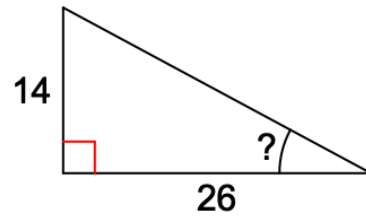
69.3°



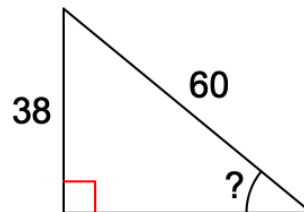
b)



c)



d)



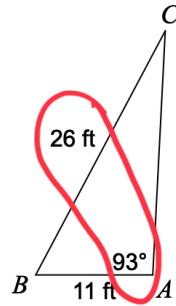
7.) (10 pts total, 5 pts each)

Law of sin/cos

a) Find $m\angle C$. Law of sine

Have a pair!

$$\frac{\sin 93^\circ}{26} = \frac{\sin C}{11}$$



$$\frac{26 \sin C}{26} = \frac{11 \sin 93^\circ}{26} \quad [\sin C] = \left[\frac{11 \sin 93^\circ}{26} \right]$$

$$C = \sin^{-1} \left[\frac{11 \sin 93^\circ}{26} \right] = \boxed{25^\circ}$$

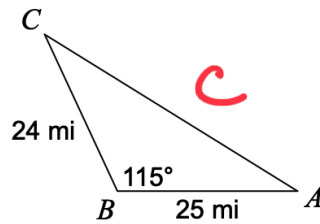
b) Find AC.

Law of cosine

$$c^2 = a^2 + b^2 - 2ab \cos C$$

$$c = \sqrt{a^2 + b^2 - 2ab \cos C}$$

$$c = \sqrt{(25)^2 + (24)^2 - 2(25)(24) \cos 115^\circ}$$



No pair!

8.) (20 pts total, 10 pts each) Graph each of the following trig functions.

a) $y = 2\sin(1/2x - \pi/4) + 3$

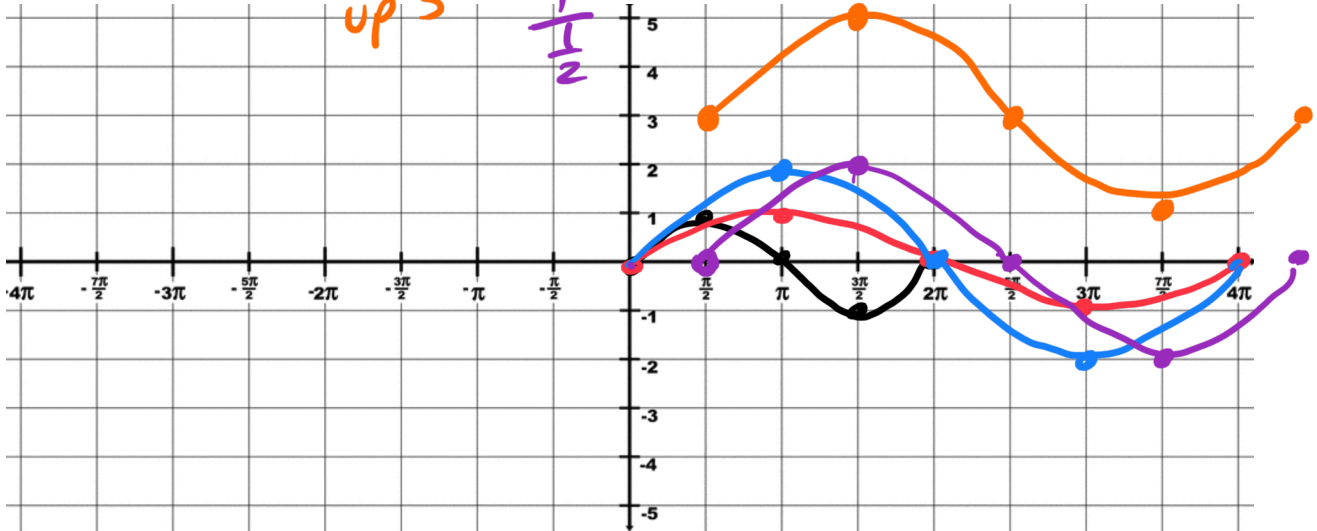
amplitude

$b = \frac{1}{2}$

up 3

$-\frac{\pi}{4} - \frac{\pi}{4} \times 2 = -\frac{\pi}{2}$
 $\frac{2\pi}{2} \div \frac{1}{2} = 4\pi$

period = $\frac{2\pi}{b} = \frac{2\pi}{\frac{1}{2}}$



b) $y = 3\cos(2x + 3\pi/4) - 1$

