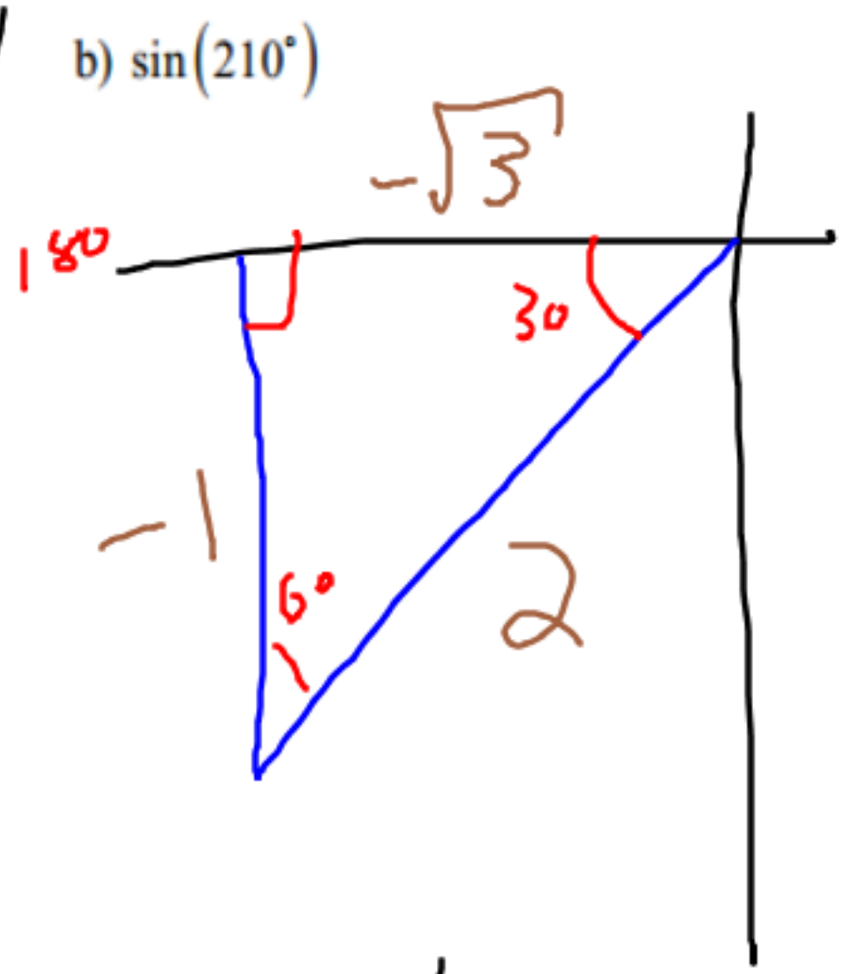
1. Determine the trig ratios. One can be done exactly, and so should be done exactly.

a) $\sec(243^\circ)$

$$\frac{1}{\cos(243)} = -2.2027$$

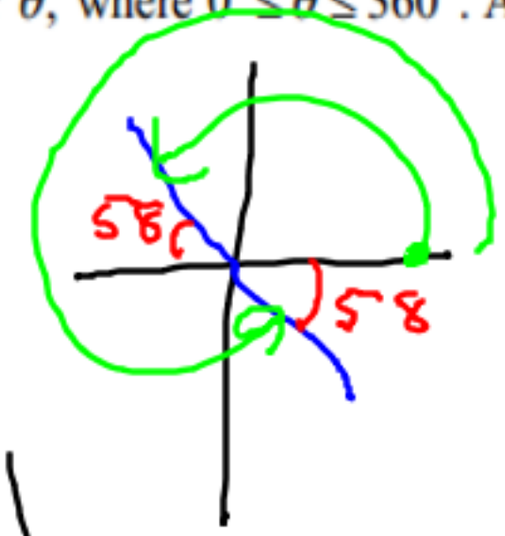
b) $\sin(210^\circ)$



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

2. Determine all values for θ, where $0° \le \theta \le 360°$. Again, if you can answer exactly, do so.

a) $\tan(\theta) = -1.58$



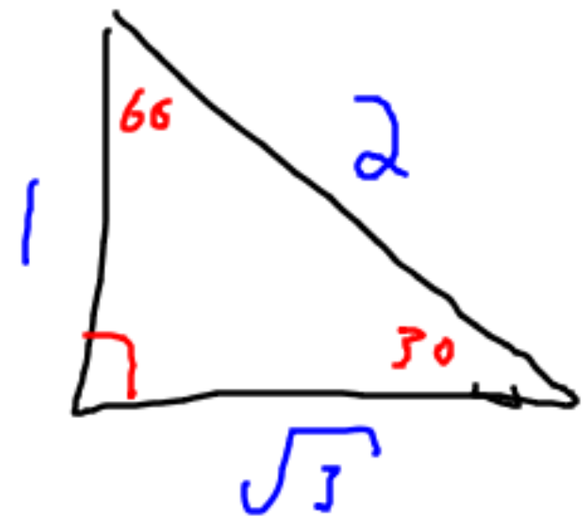
$\theta = \tan^{-1}(-1.58)$

$\theta = -58°$

$\theta = 180 - 58 = 122°$

$\theta = 360 - 58 = 302°$

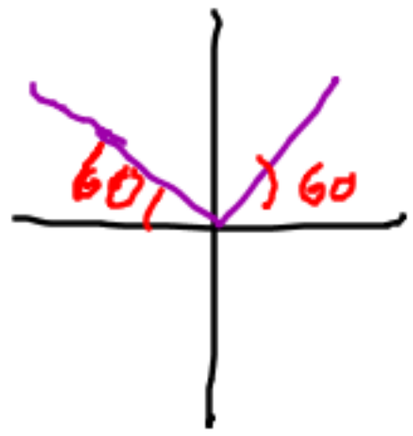
b) $\csc(\theta) = \frac{2}{\sqrt{3}}$



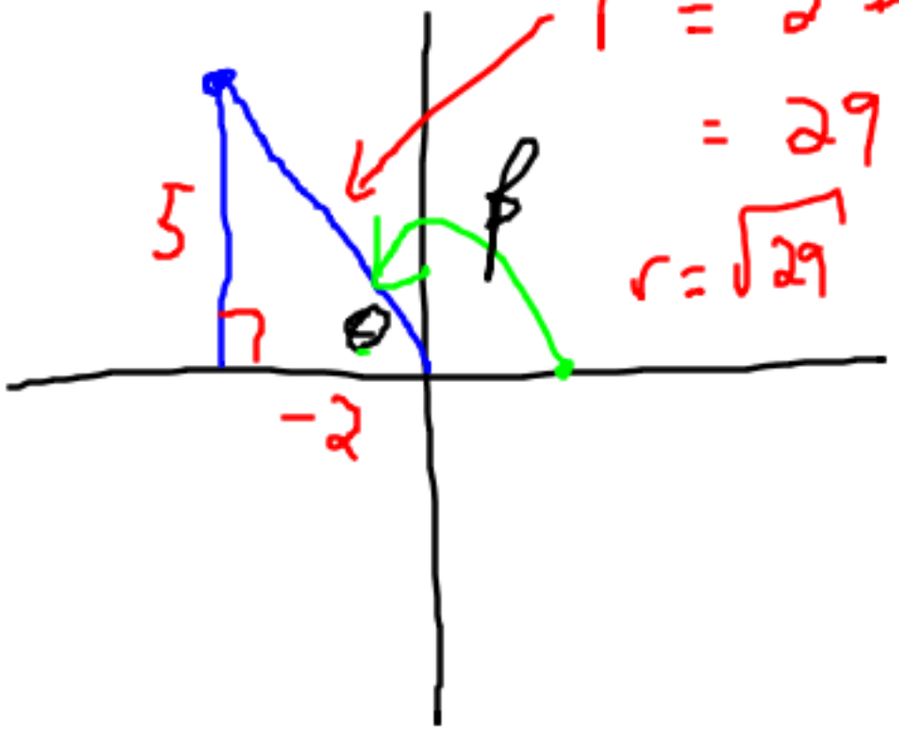
$\sin\theta = \frac{\sqrt{3}}{2}$

$\theta = 60°$

$\theta = 180 - 60 = 120°$



3. Sketch an angle of rotation, in standard position, which has the point $P(-2,5)$ at the tip of the terminal arm. Determine the primary trig ratios for that angle of rotation ~~using~~ CAST. Determine the related acute angle.



$r^2 = 2^2 + 5^2$

$= 29$

$r = \sqrt{29}$

$\sin\theta = \frac{5}{\sqrt{29}}$

$\cos\theta = \frac{-2}{\sqrt{29}}$

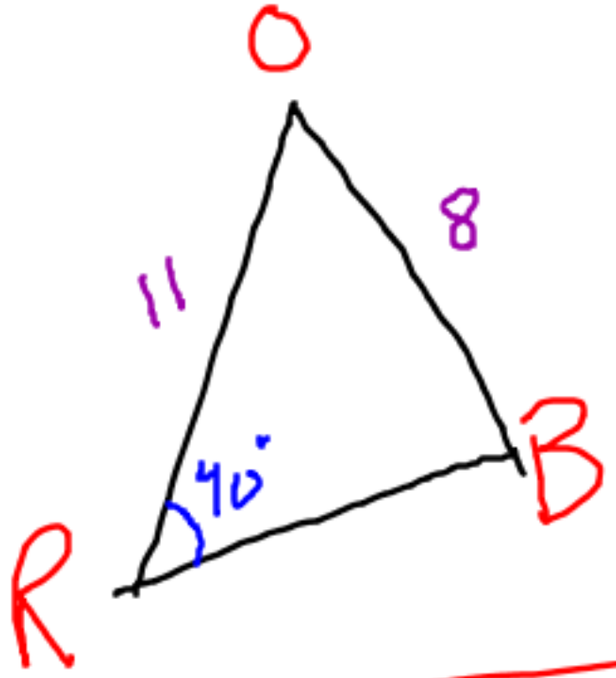
$\longrightarrow \tan\theta = \frac{5}{-2}$

$\theta = \tan^{-1}\left(\frac{5}{-2}\right) = -68^\circ$

$Acute = 68^\circ$

$\beta = 112^\circ$

4. ΔROB has $\angle R = 40°$, $b = 11cm$, $r = 8cm$. Solve the triangle(s).



$\angle R = 40$ $r = 8$ PAIR!!

$\angle O = 78$ $o = 12.2$

$\angle B = 62$ $b = 11$

$\frac{\sin B}{11} = \frac{\sin 40}{8}$

$B = \sin^{-1}\left(\frac{11 \sin 40}{8}\right)$

$B = 62°$

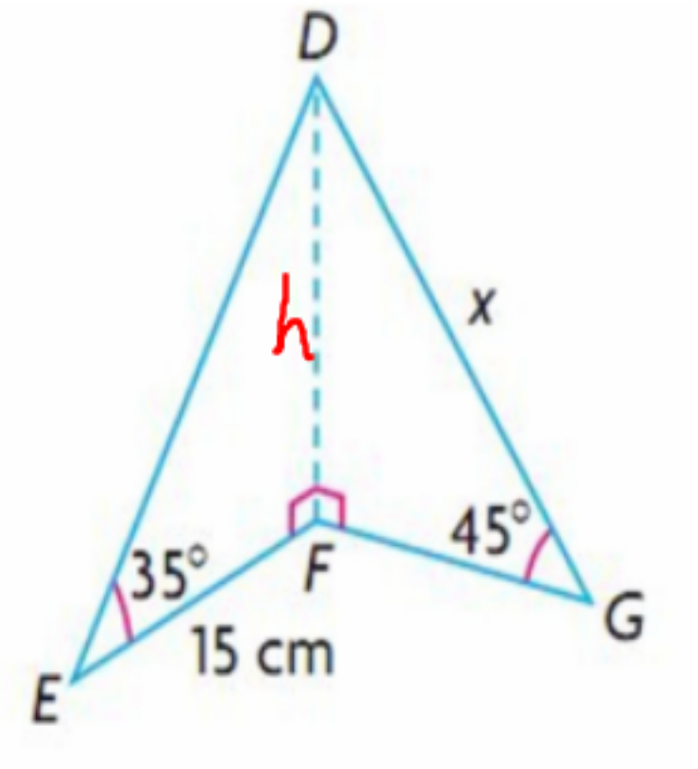
$\angle O = 180 - 40 - 62 = 78$

$o^2 = 8^2 + 11^2 - 2(8)(11)\cos 78$

$o^2 = 148.407$

$o = 12.2$

5. Determine the value of x:



$\tan 35 = \frac{h}{15}$

$h = 15 \tan 35$

$h = 10.5$

$\sin 45 = \frac{10.5}{x}$

$x = \frac{10.5}{\sin 45}$ $\therefore x = 14.8$

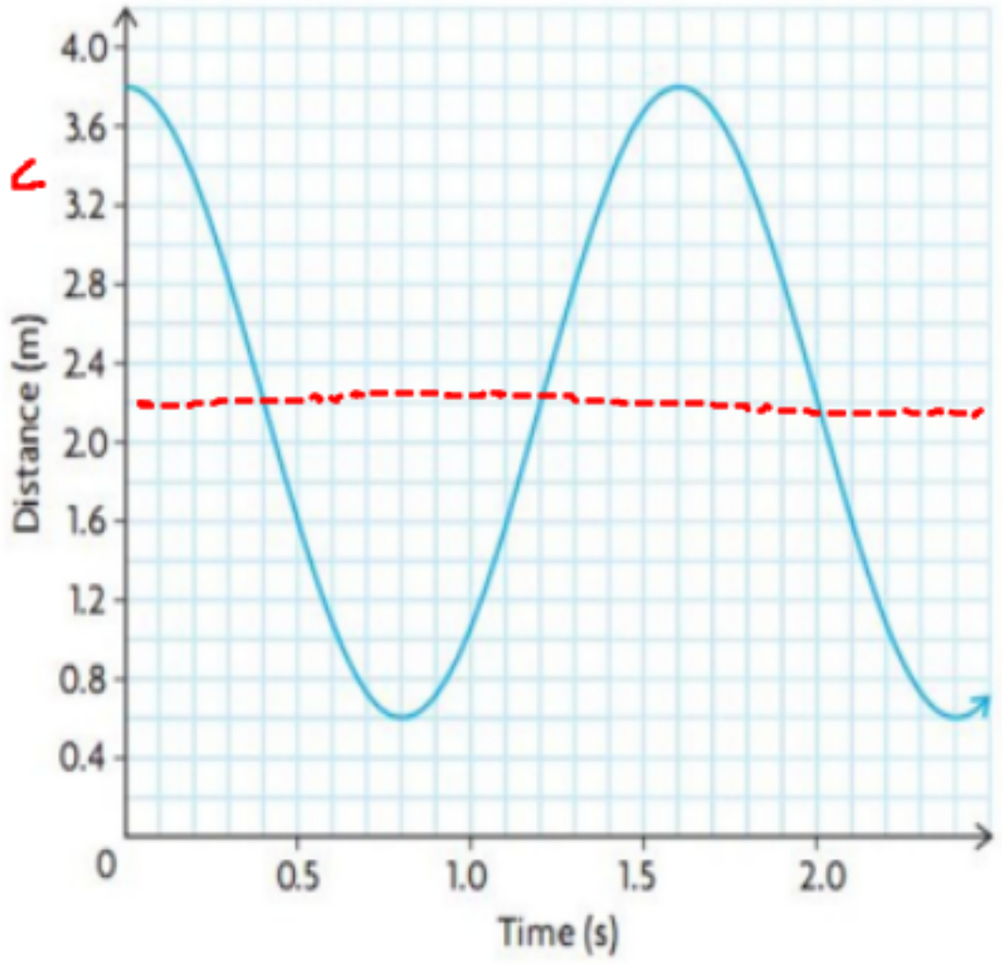
6. Express the sketch of the sinusoidal function as a Cosine function, and as a Sine function.

Which do you prefer using?

State the:

- max (peak) value 3.8
- the min (trough) value 0.6
- the equation of the central axis $y = 2.2$
- the period 1.6
- the phase shift (if necessary)

$k = \frac{360}{1.6} = 225$



$f(x) = 1.6\cos(225x) + 2.2$

$f(x) = 1.6\sin(225(x - 1.2)) + 2.2$

7. Sketch two cycles of $g(\theta)=3\cos(2\theta+60^\circ)-1$

$$g(\theta)=3\cos\left(2(\theta+30)\right)-1$$

Amp = 3

Eqm of axis = -1

Period = 180

Peak = 2

Trough = -4

"start at" = -30

8. Steve has put a baseball card in the spokes of his bike's front tire. As he rides, the tire makes 3 rotations per second. The card starts at its highest point compared to the ground, at 20 cm. Its lowest point compared to the ground is 10 cm. Write an equation that models the height of the baseball card off the ground in terms of time.

Peak = 20 Eqi of ax.s = 15 c

Trough = 10 Amp = 5 a

Period = $\frac{1}{3}$ $k = \frac{360}{\frac{1}{3}} = 360 \times 3 = 1080$

$$f(x) = 5\cos(1080x) + 15$$

9. Prove $\frac{\cos^2(x)-\sin^2(x)}{\cos^2(x)+\sin(x)\cos(x)}=1-\tan(x)$

L.S. $\dfrac{(\cos x-\sin x)\cdot(\cos x+\sin x)}{\cos x\cdot(\cos x+\sin x)}$

$\dfrac{\cos x-\sin x}{\cos x}$

$\dfrac{\cos x}{\cos x}-\dfrac{\sin x}{\cos x}=1-\tan x$

x^2-9

$=(x-3)(x+3)$

x^2+2x

$x(x+2)$