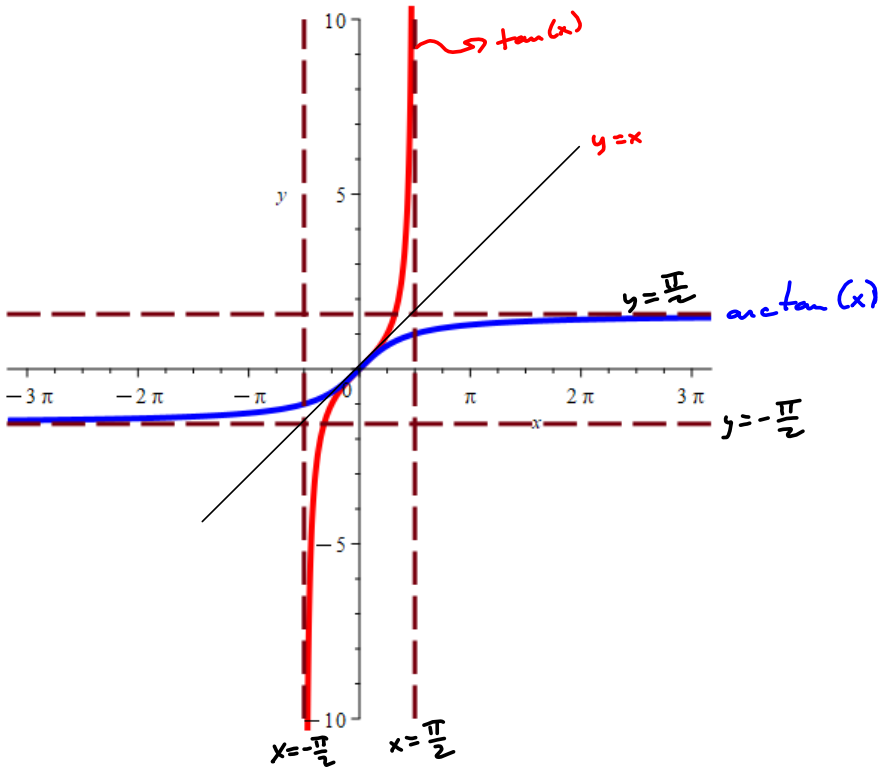
**Graph of restricted tangent function and its inverse.**




What about $\cot(x) = \frac{3}{4}$ ?

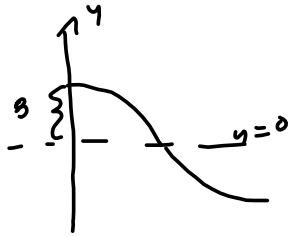
Write $\tan(x) = \frac{4}{3}$ & use TAN$^{-1}$ Key.

21. 0/1 points

Find a model for simple harmonic motion satisfying the specified conditions.

| Displacement, $d$ ($t = 0$) | Amplitude, $a$ | Period |
|---|---|---|
| 8 inches | 8 inches | 2.5 seconds |

$d =$ ✖ $8\cos\left(\frac{4\pi t}{5}\right)$




$8\cos(\omega(t-c))+d$

No midline. Assume it's 0.

$8\cos(\omega(t-c))$

Assume it starts @ $t=0$

$8\cos(\omega t)$

Period = 2.5 s

$\omega t = 2\pi$ when $t = 2.5$

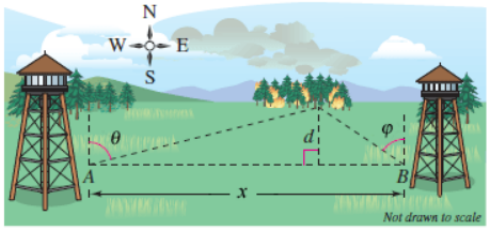
$\omega = \frac{2\pi}{t} = \frac{2\pi}{2.5}\cdot\frac{2}{2} = \frac{4\pi}{5}$

$8\cos\left(\frac{4\pi}{5}t\right)$

19. 0/1 points LarTrig10 1.8.040.MI. [3882407]

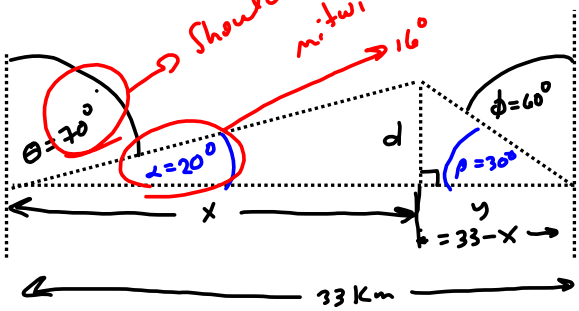
Fire tower $A$ is $x = 33$ kilometers due west of fire tower $B$. A fire is spotted from the towers, and the bearings from $A$ and $B$ are $\theta = $ N 74° E and $\varphi = $ N 60° W, respectively (see figure). Find the distance $d$ of the fire from the line segment $AB$. (Round your answer to two decimal places.)

$d =$ [ ] ✖ 6.32 km




Should be 74°, mistwit.

16°




d = distance from the E-W line to the fire

$\frac{d}{x} = \tan 20°$ $\frac{d}{33-x} = \tan 30°$

At the end: plug 'x' in to get 'd'.

$d \approx 7.37$ Km!

$d = (\tan 20°)\,x = (\tan 30°)(33-x)$

$= Ax = B(33-x) = 33B - Bx$

$Ax + Bx = 33B$

$(A+B)\,x = 33B$

$x = \frac{33B}{A+B} = \frac{\tan 30°}{\tan 20° + \tan 30°}$ (33)

```
Ans*tan(20)
      .2232377941
tan(30)/(tan(20)
+tan(30)*33
      .0297349885
Ans*tan(20)
      .0108226507
33tan(30)/(
```

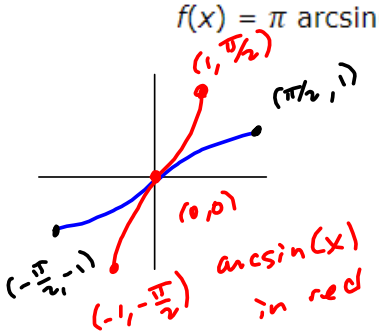
will calculate

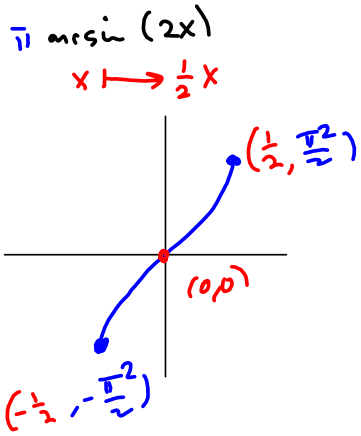
$\frac{\tan(30°)}{\tan(20°)} + (\tan(30°))(33)$

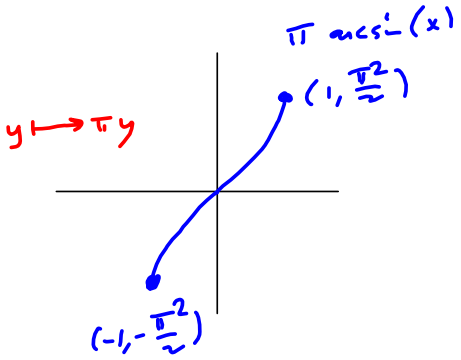
Need extra parenthesis after tan30°

Use a graphing utility to graph the function.

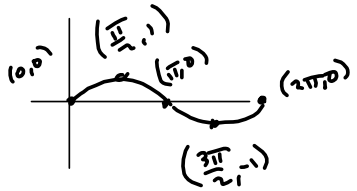
$f(x) = \pi \arcsin(2x)$



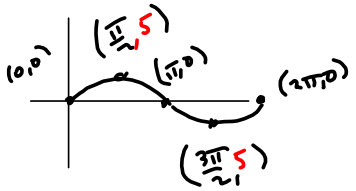



$y = 5\sin\left(\frac{\pi}{6}(x-7)\right) + 3$



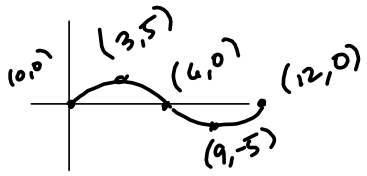

$\sin(x)$




$5\sin(x)$

$5\sin\left(\frac{\pi}{6}x\right)$

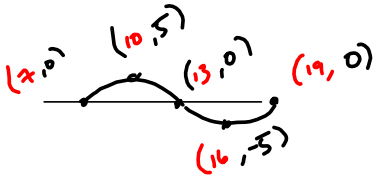
$x \longmapsto \frac{6}{\pi}x$




$5\sin\left(\frac{\pi}{6}x\right)$

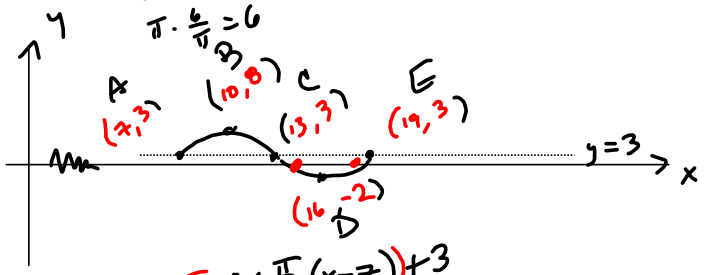
$\frac{\pi}{2}\cdot\frac{6}{\pi} = 3$

$\pi\cdot\frac{6}{\pi} = 6$



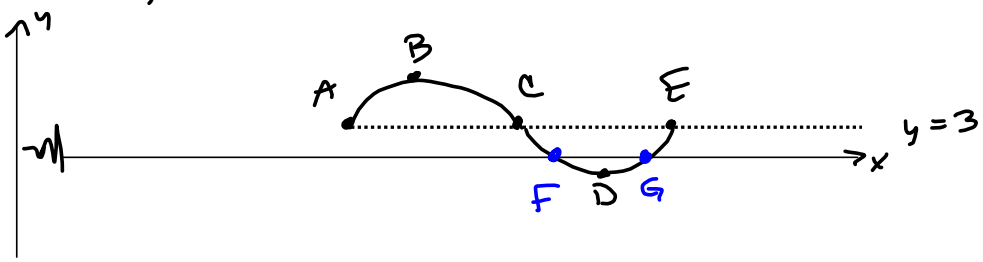

$5\sin\left(\frac{\pi}{6}(x-7)\right)$

$x \longmapsto x+7$




$5\sin\left(\frac{\pi}{6}(x-7)\right)+3$

$y \longmapsto y+3$



F & G are x-intercepts.

$5\sin\left(\frac{\pi}{6}(x-7)\right)+3=0 \Rightarrow$

$5\sin\left(\frac{\pi}{6}(x-7)\right)=-3$

$\sin\left(\frac{\pi}{6}(x-7)\right)=-\frac{3}{5}$

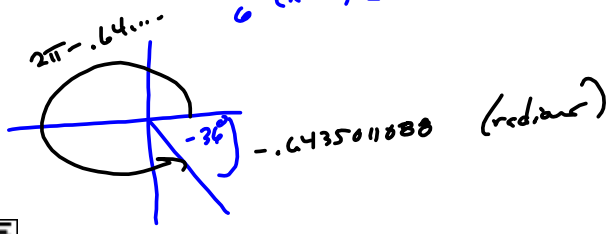
```
sin⁻¹(-3/5)
      -36.86989765
```

I'm in degrees

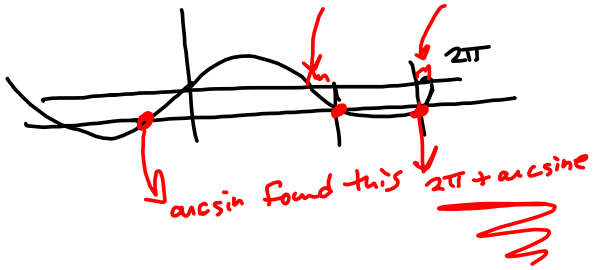
$\frac{\pi}{6}(x-7)=\arcsin\left(-\frac{3}{5}\right)$, but make sure you get the right quadrant

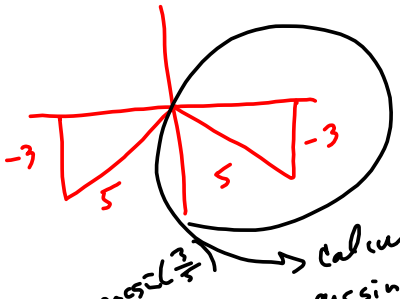
$\frac{\pi}{6}(x-7)=$

```
sin⁻¹(-3/5)
      -36.86989765
sin⁻¹(-3/5)
      -.6435011088
```




```
      -36.86989765
sin⁻¹(-3/5)
      -.6435011088
2π+Ans
      5.639684198
Ans*180/π
      323.1301024
```

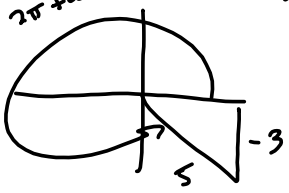


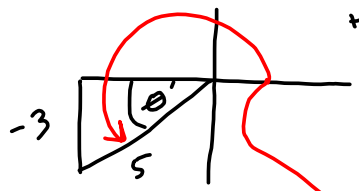




$2\pi+\arcsin\left(\frac{3}{5}\right)$

Calculator $\arcsin\left(-\frac{3}{5}\right)$

We want positive angle, $2\pi+\arcsin\left(-\frac{3}{5}\right)$





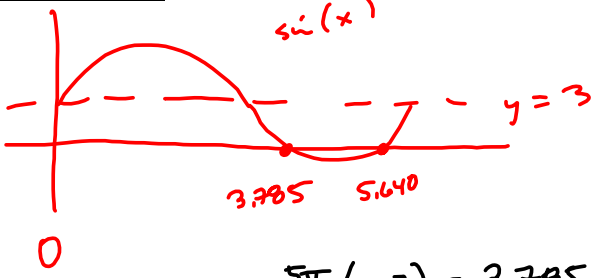

how to express this one?

$\theta' = \pi - \arcsin(-\frac{3}{5})$ is negative

$= \pi + \theta'$

```
sin⁻¹(-3/5)
      -.6435011088
π-Ans
      3.785093762
```

```
      5.639684198
Ans*180/π
      323.1301024
sin⁻¹(-3/5)
      -.6435011088
Ans+π
      2.498091545
```




$\frac{5\pi}{6}(x-7) = 3.785$ & $\frac{5\pi}{6}(x-7) = 5.640$

$x-7 = \frac{6}{5\pi}(3.785)$ & $x-7 = \frac{6}{5\pi}(5.640)$

$x = 7 + \frac{6}{5\pi}(3.785)$ & $x = 7 + \frac{6}{5\pi}(5.640)$