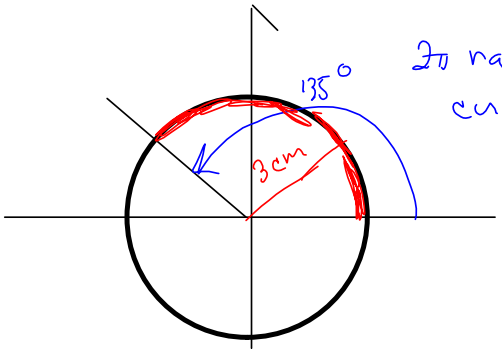
360° around the circle

2π radians to go around the circle.



$2\pi r$ = circumference of circle

$= 2\pi \cdot 3 = 6\pi$

Arc length corresponding to an angle of 135°

$\frac{2\pi}{360} = \frac{\pi}{180}$

$360^\circ \cdot \frac{\pi}{180^\circ} = 2\pi$

$135^\circ \cdot \frac{\pi}{180} = \frac{3\pi}{4}$ radians

$\frac{3}{4}$ of circumference =

$\frac{3\pi}{4} \cdot 3 = \frac{9\pi}{4} \approx 2.356194499$

```
52*10)
          8241.626224
10000(1+.05/52)^
-(52*10)
          6086.763845
3π/4
          2.35619449
```

In general, don't round until the end.

No

$\frac{3\pi}{4} \cdot 3 = \frac{3(3.14)}{4} = 2.355$

No!

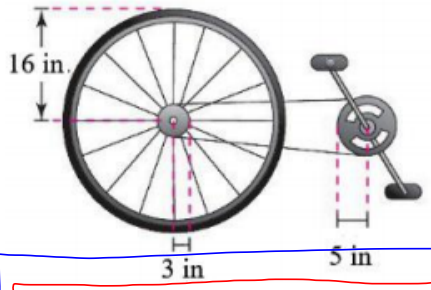
$\approx$

In general the arc length corresponding to an angle θ in radians on a circle of radius r is $s = \theta r$

$75^\circ = \left(75^\circ\right)\left(\frac{\pi \text{ radians}}{180^\circ}\right)$

$\frac{3\pi}{4} = \frac{3\pi}{4}\text{ radians} = \left(\frac{3\pi}{4}\text{ radians}\right)\left(\frac{180^\circ}{\pi \text{ radians}}\right)$

$= 135^\circ$



pedaling at a rate of 1.5 revolutions per second.

$$\left(\frac{1.5 \text{ revs front sprocket}}{1 \text{ sec}}\right)\left(\frac{\pi \text{ radians}}{1 \text{ rev}}\right)\left(\frac{5 \text{ revs rear}}{3 \text{ revs front}}\right)$$

angular speed of the front sprocket.

↳ angular speed of rear sprocket.

radians/sec on rear.

$S = r\theta$

$$\frac{(1.5)(\pi)(5)}{3}\left(\frac{\text{radians rear sprocket}}{\text{sec}}\right)(16 \text{ inches})$$

↳ Speed in $\frac{\text{inches}}{\text{sec}}$

I forgot this

$$\left(\left(\frac{(1.5)(\pi)(5)}{3}\right)(16)\frac{\text{in}}{\text{sec}}\right)\left(\frac{1 \text{ ft}}{12 \text{ in}}\right) = \frac{(1.5)(5)(16)}{3 \cdot 12}\pi \frac{\text{ft}}{\text{sec}}$$

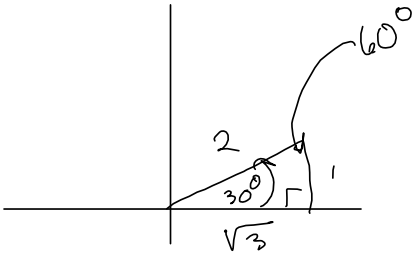
$20 \cdot 1.5 = 30$

$$= \frac{30\pi}{9} = \frac{10\pi}{3}\frac{\text{ft}}{\text{sec}} \approx 10.47197551$$

$$\approx 10.5 \text{ ft/sec}$$

10/3*π
10.47197551

Times: $\frac{60}{88} = \frac{30}{44} = \frac{15}{22}$



Kinda dipping into 1.3.

30-60 right triangle

$\tan 30^\circ = \frac{1}{\sqrt{3}}$

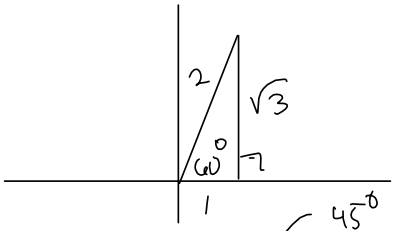
$= \tan \frac{\pi}{6}$

1-2-$\sqrt{3}$

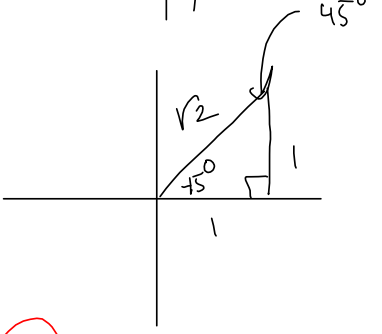
$\sin 30^\circ = \sin \frac{\pi}{6} = \frac{1}{2}$

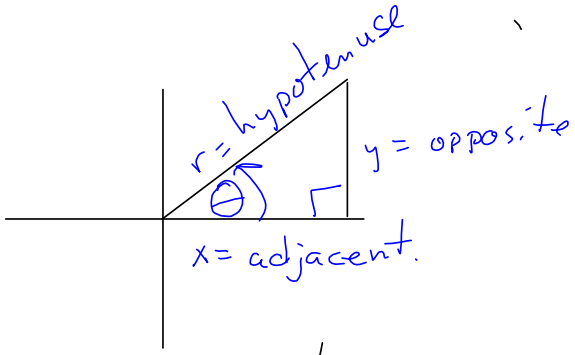
$\cos 30^\circ = \cos \frac{\pi}{6} = \frac{\sqrt{3}}{2}$

sohcahtoa



Also 1-2-$\sqrt{3}$, but 30° & 60° swapped places.





sohcahtoa !

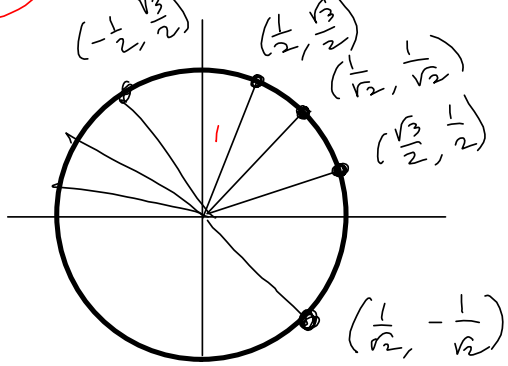
$\frac{o}{h} = \frac{opp}{hyp} = \sin\theta = \frac{y}{r}$ regardless of r. $\sin\theta$ is a fixed value for fixed θ.

$\cos\theta = \frac{x}{r} = \frac{adj}{hyp} = \frac{a}{h}$

$\tan\theta = \frac{y}{x} = \text{slope!} = \frac{o}{a}$

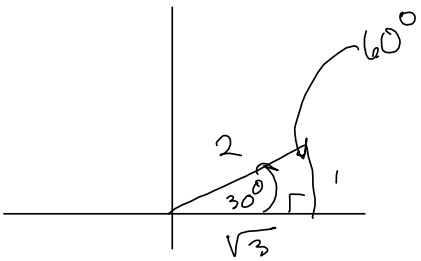
sohcahtoa

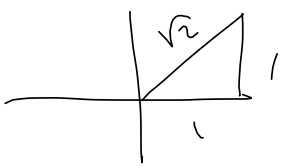
$(\cos\theta, \sin\theta)$ is a point on the unit circle



$\sin 30^\circ = \sin \frac{\pi}{6} = \frac{1}{2}$

$\cos 30^\circ = \cos \frac{\pi}{6} = \frac{\sqrt{3}}{2}$

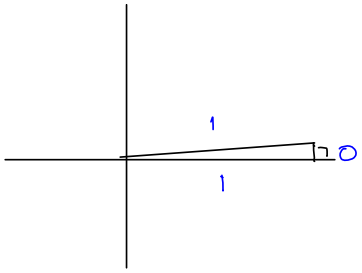




Quadrantal Angles.

0°

Degenerate Triangle

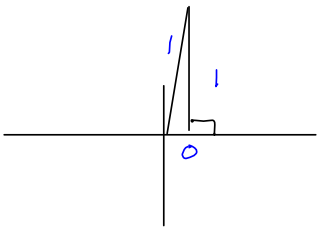


$\sin 0^\circ = \frac{0}{1} = 0$

$\cos 0^\circ = \frac{1}{1} = 1$

$\tan 0^\circ = \frac{0}{1} = 0$

$90^\circ = \frac{\pi}{2}$



$\sin 90^\circ = \frac{1}{1} = 1$

$\cos 90^\circ = \frac{0}{1} = 0$

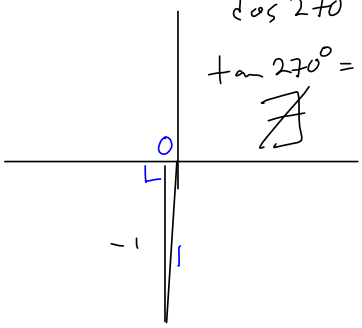
$\tan 90^\circ = \frac{1}{0}$?! ∴ ∄

$\sin 270^\circ = \sin \frac{3\pi}{2} = -1$

$\cos 270^\circ = 0$

$\tan 270^\circ = \frac{-1}{0}$ ∄

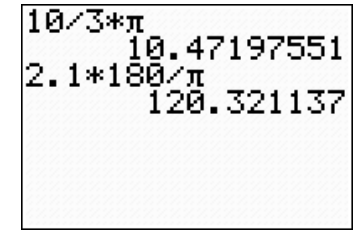
$270^\circ \cdot \frac{\pi}{180^\circ} = \frac{3}{2}\pi$



"∃" means there is or there exists.

2.1 radians ?!

$(2.1)\left(\frac{180^\circ}{\pi}\right) \approx 120.3^\circ$



Oh.