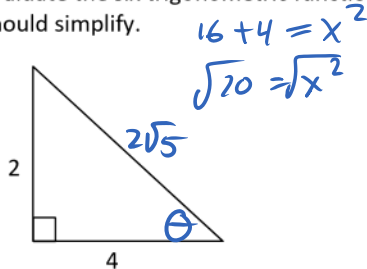


# Practice

Friday, January 8, 2016 7:29 AM

### Martian Darts

1. Evaluate the six trigonometric functions of the angle  $\theta$ . You do not need to rationalize the denominator, but you should simplify.



$$\begin{aligned} \sin \theta &= \frac{1}{\sqrt{5}} & \csc \theta &= \sqrt{5} \\ \cos \theta &= \frac{2}{\sqrt{5}} & \sec \theta &= \sqrt{5}/2 \\ \tan \theta &= \frac{1}{2} & \cot \theta &= 2 \end{aligned}$$

2. Convert the degree measure to radians or the radian measure to degrees. Then list a positive and negative angle that are coterminal with those listed (in radians and degrees).

Handwritten notes:  $\text{deg} \cdot \frac{\pi}{180} = \text{rad}$  and  $\text{rad} \cdot \frac{180}{\pi} = \text{deg}$

a.  $-50^\circ$       b.  $260^\circ$       c.  $-\frac{4\pi}{5}$       d.  $\frac{8\pi}{3}$

Calculations for a:  $-50 \cdot \frac{\pi}{180} = -\frac{5\pi}{18}$ . Coterminal angles:  $-\frac{5\pi}{18} + 2\pi = \frac{31\pi}{18}$ ,  $-\frac{5\pi}{18} - 2\pi = -\frac{41\pi}{18}$ .

Calculations for b:  $260 \cdot \frac{\pi}{180} = \frac{13\pi}{9}$ . Coterminal angles:  $\frac{13\pi}{9} + 2\pi = \frac{31\pi}{9}$ ,  $\frac{13\pi}{9} - 2\pi = -\frac{5\pi}{9}$ .

Calculations for c:  $-\frac{4\pi}{5} \cdot \frac{180}{\pi} = -144^\circ$ . Coterminal angles:  $-144^\circ + 360^\circ = 216^\circ$ ,  $-144^\circ - 360^\circ = -504^\circ$ .

Calculations for d:  $\frac{8\pi}{3} \cdot \frac{180}{\pi} = 480^\circ$ . Coterminal angles:  $480^\circ - 360^\circ = 120^\circ$ ,  $480^\circ - 720^\circ = -240^\circ$ .

3. Evaluate the function without using a calculator.

a.  $\tan 150^\circ$       b.  $\sec(-480^\circ)$       c.  $\sin\left(-\frac{5\pi}{3}\right)$       d.  $\csc\left(\frac{7\pi}{2}\right)$

Handwritten solutions using reference angles and unit circles:

- a. Reference angle  $30^\circ$ ,  $\tan 150^\circ = -\frac{1}{\sqrt{3}}$ .
- b. Reference angle  $120^\circ$ ,  $\sec(-480^\circ) = \sec(120^\circ) = -2$ .
- c. Reference angle  $30^\circ$ ,  $\sin\left(-\frac{5\pi}{3}\right) = -\frac{\sqrt{3}}{2}$ .
- d. Reference angle  $30^\circ$ ,  $\csc\left(\frac{7\pi}{2}\right) = -1$ .

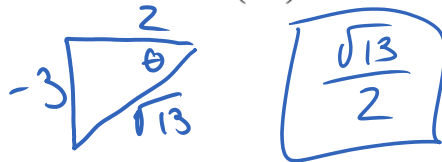
4. Point P is on the terminal side of angle  $\theta$ . Find the indicated trig ratio.

a. P = (-4, -5); find  $\cot \theta = \frac{4}{5}$

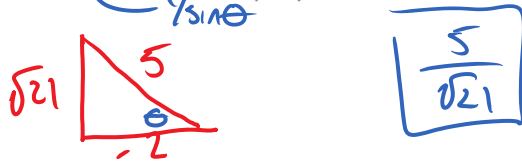
b. P = (-3, 2); find  $\sin \theta = \frac{2}{\sqrt{13}}$

5. Evaluate the following:

a. Find  $\sec \theta$  if  $\tan \theta = \left(-\frac{3}{2}\right)$  and  $\cos \theta > 0$



b. Find  $\csc \theta$  if  $\cos \theta = \left(-\frac{2}{5}\right)$  and  $\sin \theta > 0$



6. Evaluate using a calculator. Round answers to the nearest hundredth.

Deg mode  
a.  $\csc 13^\circ = \frac{1}{\sin 13}$

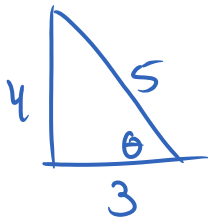
$\approx 4.45$

\* Radian mode!  
b.  $\tan 3$

$\approx -0.14$

Deg mode  
c.  $\sec 97.6^\circ$

$\approx -7.56$



$\tan \theta = \frac{4}{3}$

$\theta = \tan^{-1}\left(\frac{4}{3}\right)$

