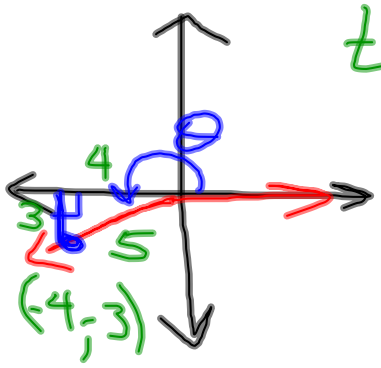
Warm-Up:

Suppose θ is an angle in standard position whose terminal side is in Quadrant III and $\tan\theta = \frac{3}{4}$. Find the remaining five trig functions.



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

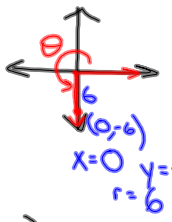
$\sin\theta = \frac{-3}{5}$ $\quad \csc\theta = \frac{5}{-3}$

$\cos\theta = \frac{-4}{5}$ $\quad \sec\theta = \frac{5}{-4}$

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

40, 18, 41

18) $(0,-6)$



$\sin\theta = \frac{-6}{6} = -1$

$\cos\theta = \frac{0}{6} = 0$

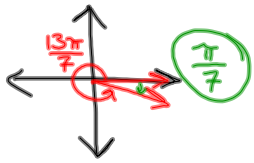
$\tan\theta = \frac{-6}{0}$ = undefined

$\csc\theta = -1$

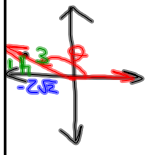
$\sec\theta$ = undefined

$\cot\theta = 0$

40) $\frac{13\pi}{7}$



44) $\sin\theta = \frac{1}{3}$ Quadrant II



$1^2 + x^2 = 3^2$

$1 + x^2 = 9$

$\sqrt{x^2} = \sqrt{8}$

$x = 2\sqrt{2}$

$\cos\theta = \frac{-2\sqrt{2}}{3}$

$\tan\theta = \frac{1}{-2\sqrt{2}} \cdot \frac{\sqrt{2}}{\sqrt{2}} = \frac{\sqrt{2}}{-4}$

$\csc\theta = 3$

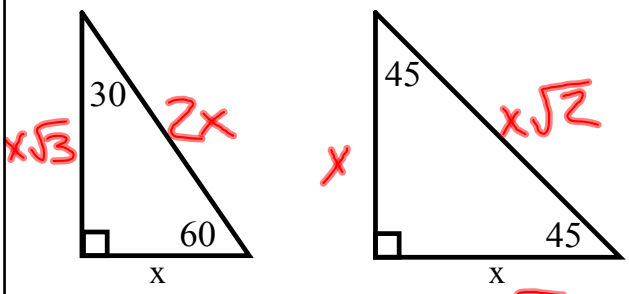
$\sec\theta = \frac{3}{-2\sqrt{2}} \cdot \frac{\sqrt{2}}{\sqrt{2}} = \frac{3\sqrt{2}}{-4}$

$\cot\theta = -2\sqrt{2}$

Section 13-3 (Continued): Patterns of Trig Functions

Using special right triangles, we can establish a pattern for special trig functions.

$\frac{x}{2x}$ $\frac{x\sqrt{3}}{2x}$ $\frac{x}{x\sqrt{3}}\cdot\frac{\sqrt{3}}{\sqrt{3}}$ $\frac{x\sqrt{3}}{x}$ $\frac{x}{x\sqrt{2}}\cdot\frac{\sqrt{2}}{\sqrt{2}}$



$x\sqrt{3}$ $2x$ x $x\sqrt{2}$

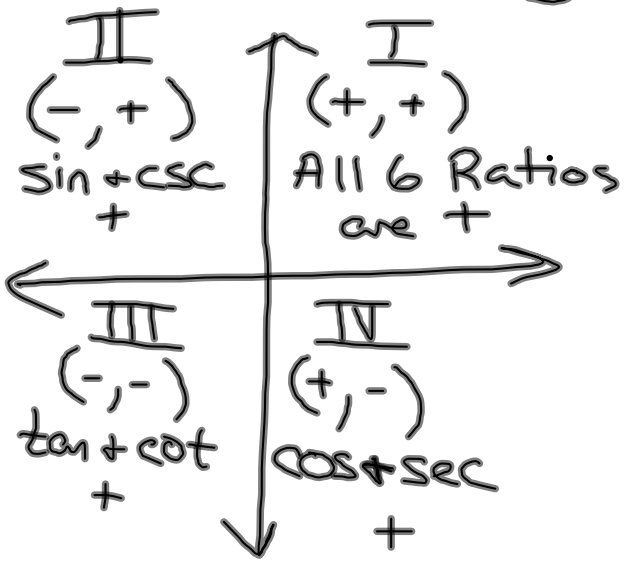
sin 30 = $\frac{1}{2}$ sin 45 = $\frac{\sqrt{2}}{2}$ sin 60 = $\frac{\sqrt{3}}{2}$

cos 30 = $\frac{\sqrt{3}}{2}$ cos 45 = $\frac{\sqrt{2}}{2}$ cos 60 = $\frac{1}{2}$

tan 30 = $\frac{\sqrt{3}}{3}$ tan 45 = 1 tan 60 = $\sqrt{3}$

The Trig Values for Special Angles is listed on page 761 in your text.

$\tan 30 = \frac{\sqrt{3}}{3}$



$\frac{\pi}{6} = 30°$

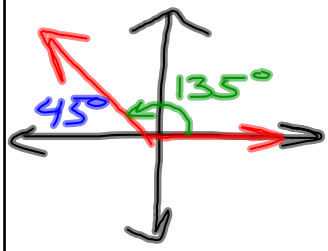
$\frac{\pi}{4} = 45°$

$\frac{\pi}{3} = 60°$

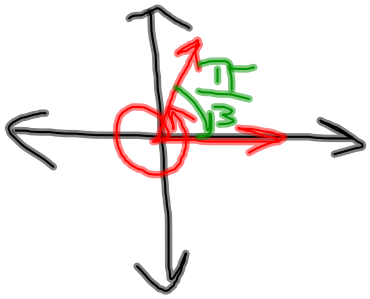
$\frac{\pi}{2} = 90°$

Examples:
Find the exact value of each trig function.

1) sin 135 = sin45 = $\frac{\sqrt{2}}{2}$

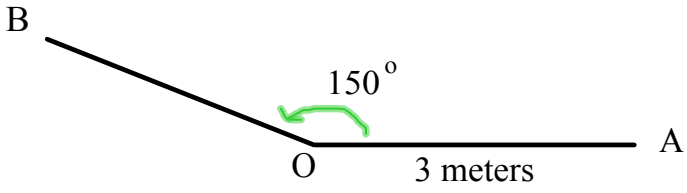


2) cot $\frac{7\pi}{3}$ = cot $\frac{\pi}{3}$ = $\frac{\sqrt{3}}{3}$



Examples:

3) In a robotics competition, a robotic arm 3 meters long is to pick up an object at point A and release it into a container at point B. The robot's arm is programmed to rotate through 150° to accomplish this task. What is the new position of the object relative to the pivot point O?



Homework: pg. 781 #1-7 all, 22-32 even, 46-48 all