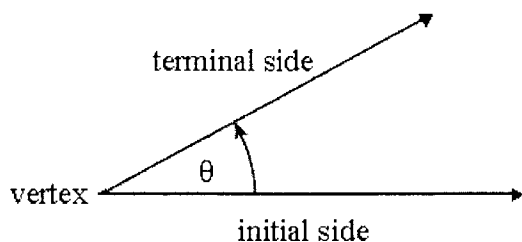


NOTES--Unit Circle Day 3



Example 1 Given a point on the terminal side of an angle, θ , find the exact value of each of the six trig functions of θ .

A) $(-4, 3)$

$$(-4)^2 + (3)^2 = h^2$$

$$25 = h^2$$

$$5 = h$$

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

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

$$\tan \theta = \frac{3}{-4} \quad \cot \theta = -\frac{4}{3}$$

B) $(-7, -5)$

$$(-7)^2 + (-5)^2 = h^2$$

$$74 = h^2$$

$$h = \sqrt{74}$$

$$\sin \theta = \frac{-5}{\sqrt{74}}$$

$$\cos \theta = \frac{-7}{\sqrt{74}}$$

$$\tan \theta = \frac{-5}{-7} = \frac{5}{7}$$

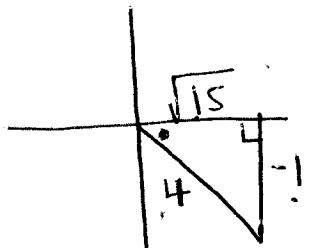
$$\csc \theta = -\frac{\sqrt{74}}{5}$$

$$\sec \theta = -\frac{\sqrt{74}}{7}$$

$$\cot \theta = \frac{7}{5}$$

Example 2 Given that $\csc \theta = -4$ and $\cos \theta > 0$, find the remaining trig functions of θ .

S	A
T	C



$$x^2 + (-4)^2 = 4^2$$

$$x^2 + 16 = 16$$

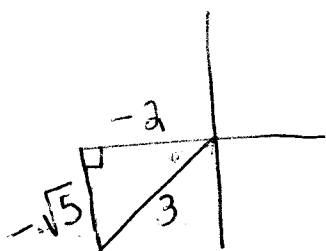
$$x^2 = 0 \quad x = 0$$

$$\sin \theta = -\frac{4}{4} = -1$$

$$\cos \theta = \frac{\sqrt{15}}{4} \quad \sec \theta = \frac{4}{\sqrt{15}}$$

$$\tan \theta = \frac{-1}{\sqrt{15}} \quad \cot \theta = -\sqrt{15}$$

Example 3 Given that $\cos \theta = -\frac{2}{3}$ and $\sin \theta < 0$, find the remaining trig functions of θ .



$$y^2 + (-2)^2 = 3^2$$

$$y^2 + 4 = 9$$

$$y^2 = 5$$

$$y = -\sqrt{5}$$

$$\sin \theta = \frac{-\sqrt{5}}{3}$$

$$\sec \theta = -\frac{3}{2}$$

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

$$\cot \theta = \frac{2}{\sqrt{5}}$$

$$\csc \theta = \frac{3}{-\sqrt{5}}$$