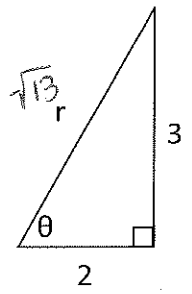
Pre-Calculus 12 Name:_____

8.1 – Trig Ratios for any Angle in Standard Position (Part II) Block: _____

Warm-up: Find the value of r, and determine the exact value of sin θ, cos θ, tan θ, csc θ, sec θ and cot θ.



$2^2+3^2=r^2$

$4+9=r^2$

$13=r^2$

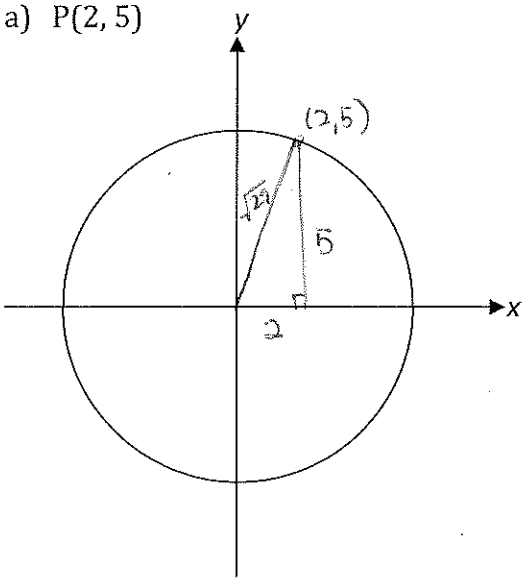
$r=\sqrt{13}$

SOHCAHTOA: $\sin\theta=\frac{3}{\sqrt{13}}$, $\cos\theta=\frac{2}{\sqrt{13}}$, $\tan\theta=\frac{3}{2}$

reciprocals: $\csc\theta=\frac{\sqrt{13}}{3}$, $\sec\theta=\frac{\sqrt{13}}{2}$, $\cot\theta=\frac{2}{3}$

Ex. 1. For each point P(x, y) on the terminal arm of an angle θ in standard position, determine the exact values of the six trig ratios.

a) P(2, 5)



$2^2+5^2=r^2$

$4+25=r^2$

$29=r^2$

$r=\sqrt{29}$

$\sin\theta=\frac{5}{\sqrt{29}}$ $\csc\theta=\frac{\sqrt{29}}{5}$

$\cos\theta=\frac{2}{\sqrt{29}}$ $\sec\theta=\frac{\sqrt{29}}{2}$

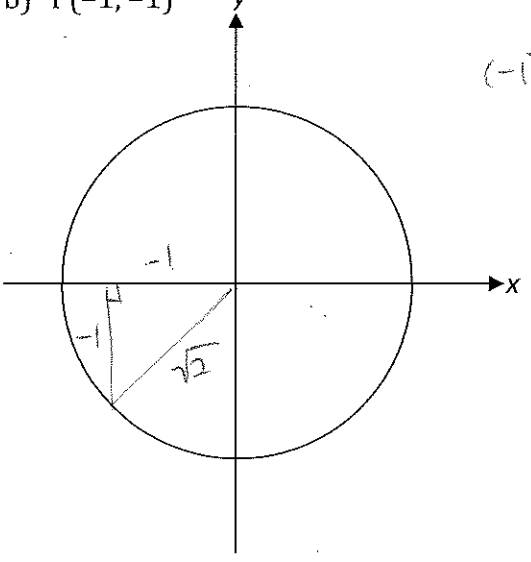
$\tan\theta=\frac{5}{2}$ $\cot\theta=\frac{2}{5}$

$\theta=68°$

$\tan^{-1}\left(\frac{5}{2}\right)=$

or $\sin^{-1}\left(\frac{5}{\sqrt{29}}\right)$

b) P(−1, −1)



$(-1)^2+(-1)^2=r^2$

$1+1=r^2$

$2=r^2$

$r=\sqrt{2}$

$\sin\theta=\frac{-1}{\sqrt{2}}$ $\csc\theta=\frac{\sqrt{2}}{-1}=-\sqrt{2}$

$\cos\theta=\frac{-1}{\sqrt{2}}$ $\sec\theta=\frac{\sqrt{2}}{-1}=-\sqrt{2}$

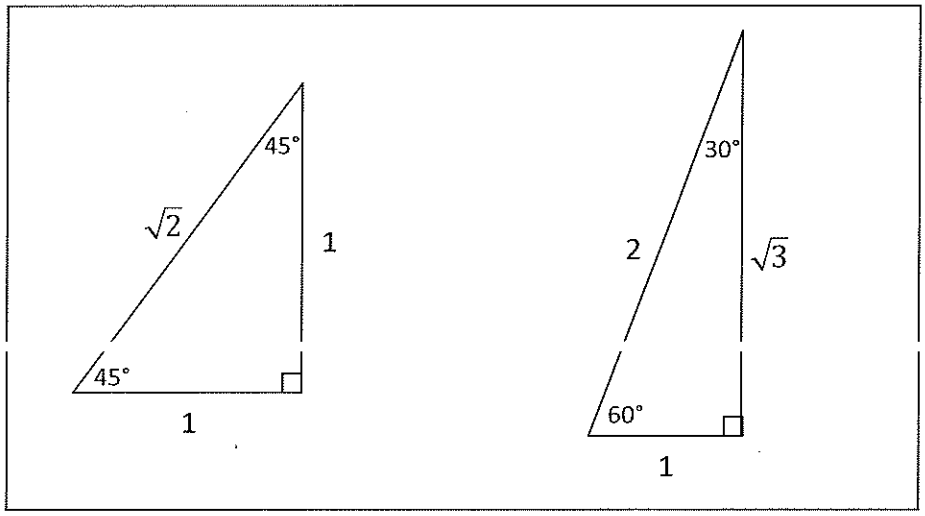
$\tan\theta=\frac{-1}{-1}=1$ $\cot\theta=\frac{-1}{-1}=1$

$\theta=225°$

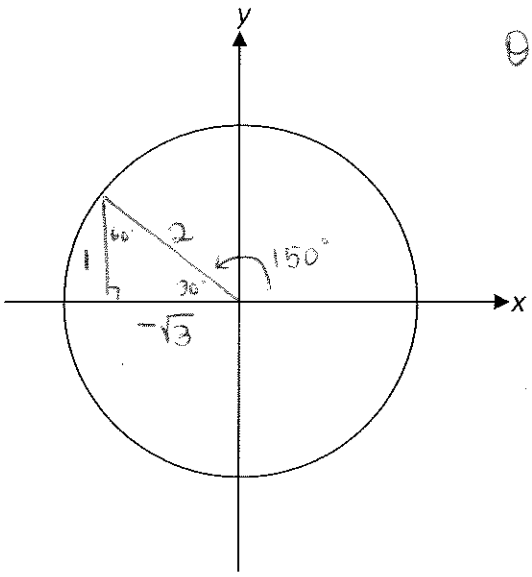
$\tan^{-1}(1)=45$

$\theta=180+45$

Recall: Special Triangles



Ex. 2 Determine the exact value of the 6 trig ratios for 150°.



$\theta_R = 30°$

$\sin\theta = \frac{1}{2}$ $\quad \csc\theta = \frac{2}{1} = 2$

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

$\tan\theta = \frac{1}{-\sqrt{3}}$ $\quad \cot\theta = \frac{-\sqrt{3}}{1} = -\sqrt{3}$

** Complete p. 536 in partners.

p. 534 # 3, 6-11