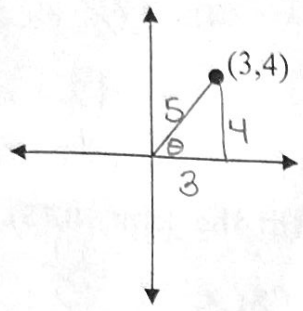
Pre-Calculus

4.3 Practice with Trigonometry

Key

1. Find the exact values of the six trig functions of θ in standard position at the point (3, 4).



a) *Use the Pythagorean theorem to find the radius* 5

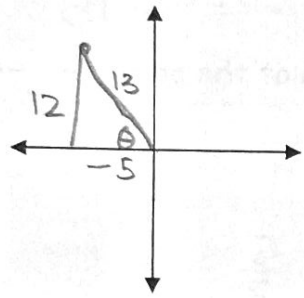
b) *Use* SohCahToa *to find the values of the six trig functions.*

$\sin\theta = \frac{4}{5}$ $\quad \csc\theta = \frac{5}{4}$

$\cos\theta = \frac{3}{5}$ $\quad \sec\theta = \frac{5}{3}$

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

2. Find the exact values of the six trig functions in standard position at the point (-5, 12).

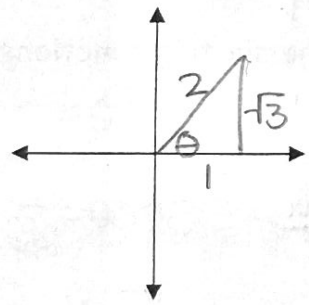


$\sin\theta = \frac{12}{13}$ $\quad \csc\theta = \frac{13}{12}$

$\cos\theta = \frac{-5}{13}$ $\quad \sec\theta = -\frac{13}{5}$

$\tan\theta = -\frac{12}{5}$ $\quad \cot\theta = -\frac{5}{12}$

3. If $\cos\theta = \frac{1}{2}$ and θ lies in quadrant I, find the exact values of the six trig functions.



$1^2 + b^2 = (2)^2$

$b^2 = 4 - 1$

$b^2 = 3$

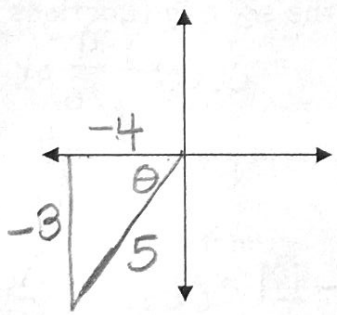
$b = \sqrt{3}$

$\sin\theta = \frac{\sqrt{3}}{2}$ $\quad \csc\theta = \frac{2}{\sqrt{3}}$ or $\frac{2\sqrt{3}}{3}$

$\cos\theta = \frac{1}{2}$ $\quad \sec\theta = 2$

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

4. If $\tan\theta = \frac{3}{4}$ and θ lies in quadrant III, find the exact values of the six trig functions.



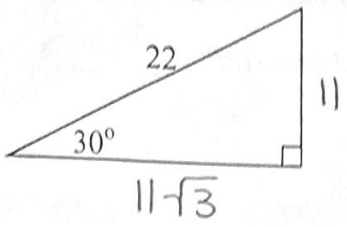
$\sin\theta = -\frac{3}{5}$ $\quad \csc\theta = -\frac{5}{3}$

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

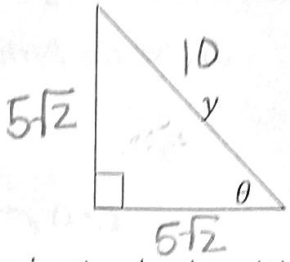
$\tan\theta = \frac{3}{4}$ $\quad \cot\theta = \frac{4}{3}$

Solve for the missing sides, using the information provided below.

5.



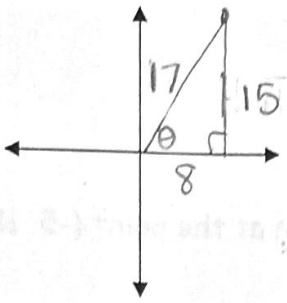
6. $\theta = 45°$, $y = 10$



$\frac{10}{\sqrt{2}} = \frac{x\sqrt{2}}{\sqrt{2}}$

$\frac{10}{\sqrt{2}} \cdot \frac{\sqrt{2}}{\sqrt{2}} = \frac{10\sqrt{2}}{2} = 5\sqrt{2}$

7. Find the exact values of the six trig functions in standard position at the point (8,15).



$8^2 + 15^2 = x^2$

$\sqrt{289} = \sqrt{x^2}$

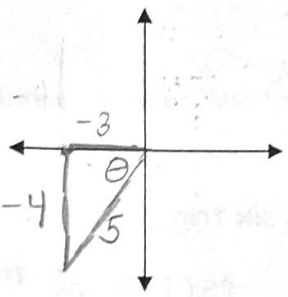
$17 = x$

$\sin\theta = \frac{15}{17}$ $\quad \csc\theta = \frac{17}{15}$

$\cos\theta = \frac{8}{17}$ $\quad \sec\theta = \frac{17}{8}$

$\tan\theta = \frac{15}{8}$ $\quad \cot\theta = \frac{8}{15}$

8. Find the exact values of the six trig functions in standard position at the point $(-3, -4)$.



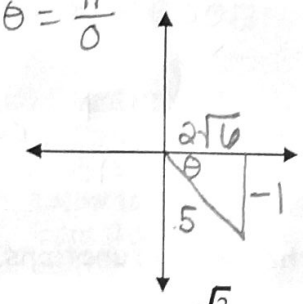
$\sin\theta = -\frac{4}{5}$ $\quad \csc\theta = -\frac{5}{4}$

$\cos\theta = -\frac{3}{5}$ $\quad \sec\theta = -\frac{5}{3}$

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

9. If $\csc\theta = -5$ and θ lies in quadrant IV, find the exact values of the six trig functions.

$\csc\theta = \frac{H}{O}$



$(-1)^2 + b^2 = 5^2$

$b^2 = 25 - 1$

$\sqrt{b^2} = \sqrt{24} = \sqrt{4 \cdot 6}$

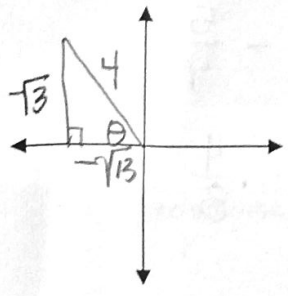
$b = 2\sqrt{6}$

$\sin\theta = -\frac{1}{5}$ $\quad \csc\theta = -5$

$\cos\theta = \frac{2\sqrt{6}}{5}$ $\quad \sec\theta = \frac{5}{2\sqrt{6}}$ or $\frac{5\sqrt{6}}{12}$

$\tan\theta = \frac{-1}{2\sqrt{6}}$ or $\frac{-\sqrt{6}}{12}$ $\quad \cot\theta = -2\sqrt{6}$

10. If $\sin\theta = \frac{\sqrt{3}}{4}$ and θ lies in quadrant II, find the exact values of the six trig functions.



$(\sqrt{3})^2 + b^2 = 4^2$

$\sqrt{b^2} = \sqrt{16 - 3}$

$b = -\sqrt{13}$

$\sin\theta = \frac{\sqrt{3}}{4}$ $\quad \csc\theta = \frac{4}{\sqrt{3}}$ or $\frac{4\sqrt{3}}{3}$

$\cos\theta = -\frac{\sqrt{13}}{4}$ $\quad \sec\theta = \frac{-4}{\sqrt{13}} = \frac{-4\sqrt{13}}{13}$

$\tan\theta = -\frac{\sqrt{3}}{\sqrt{13}} = -\frac{\sqrt{39}}{13}$ $\quad \cot\theta = -\frac{\sqrt{13}}{\sqrt{3}} = -\frac{\sqrt{39}}{3}$