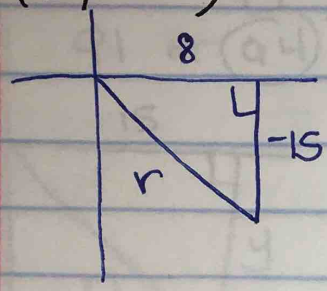
HM3 - Trig Values in the Coordinate Plane Continued

① $(8, -15)$



$r^2 = 8^2 + (-15)^2$

$r^2 = 64 + 225$

$r^2 = 289$

$r = 17$

$\sin\theta = -15/17$ $\quad \csc\theta = -17/15$

$\cos\theta = 8/17$ $\quad \sec\theta = 17/8$

$\tan\theta = -15/8$ $\quad \cot\theta = -8/15$

② $\sin\theta < 0$ $\quad \cos\theta < 0$

Q3 Q4 $\quad$ Q2 Q3

Q3

③ $\sin\theta > 0$ $\quad \cos\theta > 0$

Q1 Q2 $\quad$ Q1 Q4

Q1

④ $\sin\theta > 0$ $\quad \tan\theta > 0$

Q1 Q2 $\quad$ Q1 Q3

Q1

⑤ $\sec\theta > 0$ $\quad \csc\theta > 0$

Q1 Q4 $\quad$ Q1 Q2

Q1

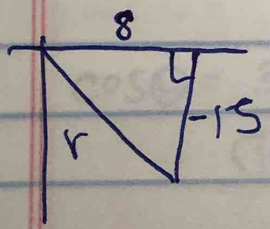
⑥ $\sin\theta < 0$ $\quad \sec\theta > 0$

Q3 Q4 $\quad$ Q1 Q4

Q4

⑦ $\tan\theta = -15/8$, $\sin\theta < 0$

Q2 or Q4 $\quad$ Q3 or Q4



$r^2 = 8^2 + (-15)^2$

$r^2 = 289$

$r = 17$

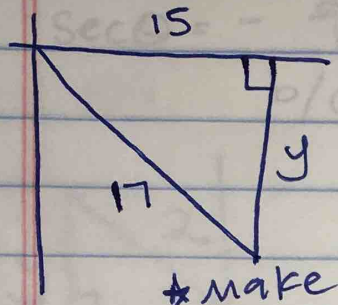
$\sin\theta = \frac{-15}{17}$ $\quad \csc\theta = \frac{-17}{5}$

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

$\cot\theta = -8/15$

(8) $\cos\theta = \frac{15}{17}$, $\tan\theta < 0$

Q1 or (Q4), Q2 or (Q4)



$17^2 = 15^2 + y^2$

$289 = 225 + y^2$

$64 = y^2$

$8 = y$

*Make it negative b/c Q4

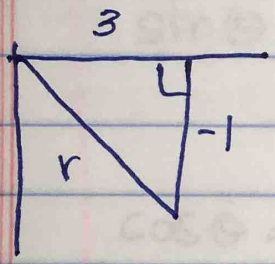
$\sin\theta = \frac{-8}{17}$ $\quad \csc\theta = \frac{-17}{8}$

$\sec\theta = \frac{17}{15}$

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

(9) $\cot\theta = -3$, $\cos\theta > 0$

Q2 or (Q4), Q1 or (Q4)



$r^2 = (3)^2 + (-1)^2$

$r^2 = 9 + 1$

$r^2 = 10$

$r = \sqrt{10}$

$\cot\theta = -3 \rightarrow -\frac{3}{1}$

*the negative is attached to y b/c Q4

$\sin\theta = \frac{-1}{\sqrt{10}} \cdot \frac{\sqrt{10}}{\sqrt{10}}$ $\quad \sin\theta = \frac{-\sqrt{10}}{10}$ $\quad \csc\theta = -\sqrt{10}$

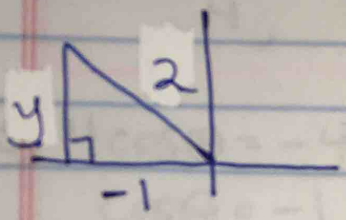
$\cos\theta = \frac{3}{\sqrt{10}} \cdot \frac{\sqrt{10}}{\sqrt{10}}$ $\quad \cos\theta = \frac{3\sqrt{10}}{10}$ $\quad \sec\theta = \frac{\sqrt{10}}{3}$

$\tan\theta = -1/3$

(10) $\sec\theta = -2$, $\sin\theta > 0$

Q2 or Q3 Q1 or Q2

$\sec\theta = -\frac{2}{1}$ the negative must be attached to x b/c r is always positive!



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

$1 + y^2 = 4$

$y^2 = 3$

$y = \sqrt{3}$ *keep it positive b/c Q2

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

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

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

(11) $-1 + \sin\theta = -\frac{1}{2}$

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

$\theta = \frac{\pi}{6}, \frac{5\pi}{6}$

(12) $1 + \tan\theta = \frac{3-\sqrt{3}}{3}$

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

$\tan\theta = \frac{3-\sqrt{3}}{3} - \frac{3}{3}$

$\tan\theta = \frac{-\sqrt{3}}{3}$

$\theta = \frac{5\pi}{6}, \frac{11\pi}{6}$

(13) $8\sin\theta = -4\sqrt{2}$

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

$\theta = \frac{5\pi}{4}, \frac{7\pi}{4}$

(14) $\frac{1}{4}\cos\theta = 0$

$\cos\theta = 0$

$\theta = \frac{\pi}{2}, \frac{3\pi}{2}$

(15) $4\cos\theta = -4$

$\cos\theta = -1$

$\theta = \pi$

(16) $-\frac{1}{5}\sin\theta = 0$

$\sin\theta = 0$

$\theta = 0, \pi, 2\pi$

(17) $-1 - \frac{1}{5}\tan\theta = \frac{-5-\sqrt{3}}{5}$

$-\frac{1}{5}\tan\theta = \frac{-5-\sqrt{3}}{5} + 1$

$\frac{-1}{5}\tan\theta = \frac{-5-\sqrt{3}}{5} + \frac{5}{5}$

$\frac{-1}{5}\tan\theta = \frac{-\sqrt{3}}{5}$

$\tan\theta = \sqrt{3}$

$\theta = \frac{\pi}{3}, \frac{4\pi}{3}$

(18) $2 - \frac{1}{3}\sin\theta = \frac{5}{3}$

$-\frac{1}{3}\sin\theta = \frac{5}{3} - 2$

$-\frac{1}{3}\sin\theta = -\frac{1}{3}$

$\sin\theta = 1$

$\theta = \pi/2$

(19) $5 = 5 - 2\tan\theta$

$0 = -2\tan\theta$

$0 = \tan\theta$

$\theta = 0, \pi, 2\pi$

(20) $7 = 4 + 3\sin\theta$

$3 = 3\sin\theta$

$1 = \sin\theta$

$\theta = \frac{\pi}{2}$