

HW #4 Math 143

Section 6.2

(43) Write $\cot \theta$ in terms of $\sin \theta$ for an acute angle θ .

$$\cot \theta = \frac{\cos \theta}{\sin \theta}$$

We know $\sin^2 \theta + \cos^2 \theta = 1$

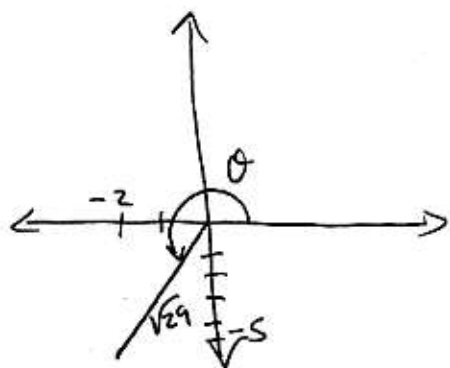
or $\cos^2 \theta = 1 - \sin^2 \theta$

$$\cos \theta = \sqrt{1 - \sin^2 \theta}$$

← Positive because θ is acute.

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

(73)



$$r^2 = (-2)^2 + (-5)^2$$

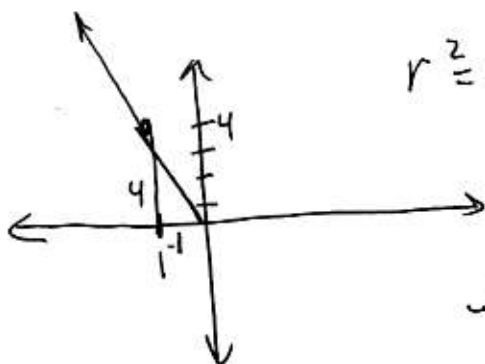
$$r^2 = 4 + 25$$

$$r = \sqrt{29}$$

$$\sin \theta = \frac{-5}{\sqrt{29}} \quad \cos \theta = \frac{-2}{\sqrt{29}} \quad \tan \theta = \frac{5}{2}$$

$$\csc \theta = -\frac{\sqrt{29}}{5} \quad \sec \theta = -\frac{\sqrt{29}}{2} \quad \cot \theta = \frac{2}{5}$$

(75)



$$r^2 = 4^2 + 1^2$$

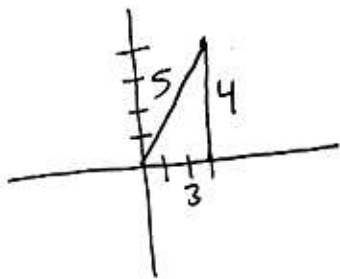
$$r^2 = 16 + 1$$

$$r = \sqrt{17}$$

$$\sin \theta = \frac{1}{\sqrt{17}} \quad \cos \theta = \frac{-4}{\sqrt{17}} \quad \tan \theta = -\frac{1}{4}$$

$$\csc \theta = \frac{\sqrt{17}}{1} \quad \sec \theta = -\sqrt{17} \quad \cot \theta = -\frac{1}{4}$$

77



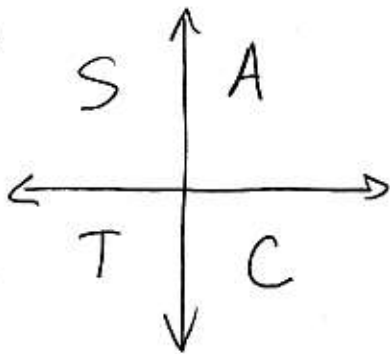
$$r^2 = 4^2 + 3^2$$

$$r = \sqrt{25} = 5.$$

$$\sin \theta = \frac{4}{5} \quad \cos \theta = \frac{3}{5} \quad \tan \theta = \frac{4}{3}$$

$$\csc \theta = \frac{5}{4} \quad \sec \theta = \frac{5}{3} \quad \cot \theta = \frac{3}{4}.$$

83

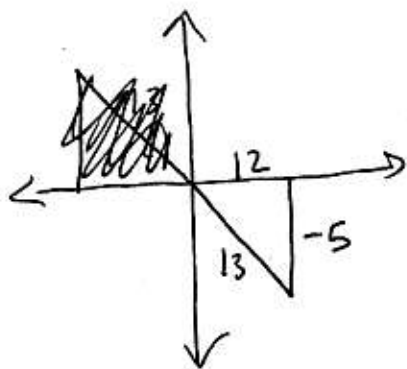


9) IV b) III c) II d) III.

87

$$\sin \theta = -\frac{5}{13} \quad \sec \theta > 0$$

So $\sin \theta$ is negative and $\sec \theta$ is positive means quadrant ~~III~~ IV



$$13^2 = (-5)^2 + a^2$$

$$169 = 25 + a^2$$

$$144 = a^2$$

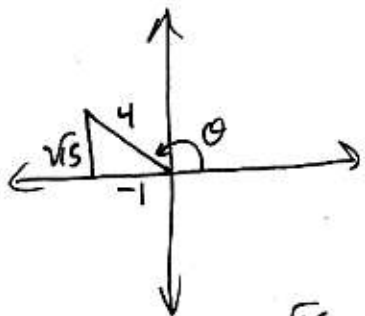
$$12 = a$$

$$\sin \theta = -\frac{5}{13} \quad \cos \theta = \frac{12}{13} \quad \tan \theta = -\frac{5}{12}$$

$$\csc \theta = -\frac{13}{5} \quad \sec \theta = \frac{13}{12} \quad \cot \theta = -\frac{12}{5}.$$

c

91) $\sec \theta = -4$ $\csc \theta > 0$ $\sec \theta < 0$ & $\csc \theta > 0$
 means we are in quadrant II.



$$4^2 = (-1)^2 + a^2$$

$$16 = 1 + a^2$$

$$\sqrt{15} = a$$

$$\sin \theta = \frac{\sqrt{15}}{4} \quad \cos \theta = -\frac{1}{4} \quad \tan \theta = \frac{\sqrt{15}}{-1} = -\sqrt{15}$$

$$\csc \theta = \frac{4}{\sqrt{15}} \quad \sec \theta = -4 \quad \cot \theta = -\frac{1}{\sqrt{15}}$$

93) $\sqrt{\sec^2 \theta - 1}$ ~~$\frac{\pi}{2} < \theta < \frac{3\pi}{2}$~~ $\frac{\pi}{2} < \theta < \pi$ ← This means θ is in the 2nd quadrant.
 This means θ is in the 2nd quadrant.

$$\sec^2 \theta - 1 = \tan^2 \theta \text{ so}$$

$$\sqrt{\sec^2 \theta - 1} = \sqrt{\tan^2 \theta} = |\tan \theta|$$

In quadrant II $\tan \theta < 0$ so

$$|\tan \theta| = -\tan \theta$$