

* Note: Your work may look

Name _____ different! (that's ok)

there are many different identities on your notecard that can be used! 😊

Use identities to find the value of each expression.

1) Find $\cot \theta$ and $\sec \theta = -5/2$... easy b/c you were given $\cos \theta$!

if $\cos \theta = -\frac{2}{5}$ and $\csc \theta > 0$. \ominus \oplus \oplus \ominus

$$\begin{aligned} \tan^2 \theta + 1 &= \sec^2 \theta \\ \tan^2 \theta + 1 &= (-5/2)^2 \\ \tan^2 \theta + 1 &= 25/4 \\ \tan^2 \theta &= 21/4 \end{aligned}$$

$$\tan \theta = \pm \frac{\sqrt{21}}{\sqrt{4}} = \pm \frac{\sqrt{21}}{2}$$

$$\cot \theta = \frac{-2}{\sqrt{21}} = -\frac{2\sqrt{21}}{21}$$

2) Find $\csc \theta$ and $\tan \theta = 4/7$

if $\cot \theta = \frac{7}{4}$ and $\sin \theta > 0$. \oplus \oplus \oplus \oplus

$$1 + \cot^2 \theta = \csc^2 \theta$$

$$1 + (7/4)^2 = \csc^2 \theta$$

$$1 + 49/16 = \csc^2 \theta$$

$$\frac{65}{16} = \csc^2 \theta$$

$$\pm \frac{\sqrt{65}}{\sqrt{16}} = \csc \theta$$

$$\frac{+\sqrt{65}}{4} = \csc \theta$$

3) Find $\sec \theta$ and $\csc \theta$

if $\cot \theta = -\frac{5}{2}$ and $\csc \theta > 0$. \oplus \oplus \oplus \oplus

$$1 + \cot^2 \theta = \csc^2 \theta$$

$$1 + (-5/2)^2 = \csc^2 \theta$$

$$1 + 25/4 = \csc^2 \theta$$

$$29/4 = \csc^2 \theta$$

$$\pm \frac{\sqrt{29}}{2} = \csc \theta$$

$$\frac{+\sqrt{29}}{2} = \csc \theta$$

4) Find $\sec \theta$ and $\cot \theta$

if $\csc \theta = 4$ and $\tan \theta < 0$. \oplus \oplus \oplus \oplus

$$1 + \tan^2 \theta = \sec^2 \theta$$

$$1 + (-2/5)^2 = \sec^2 \theta$$

$$1 + 4/25 = \sec^2 \theta$$

$$\frac{29}{25} = \sec^2 \theta$$

$$\pm \frac{\sqrt{29}}{5} = \sec \theta$$

$$-\frac{\sqrt{29}}{5} = \sec \theta$$

$$1 + \cot^2 \theta = \csc^2 \theta$$

$$1 + \cot^2 \theta = 16$$

$$\cot^2 \theta = 15$$

$$\cot \theta = \pm \sqrt{15}$$

$$\cot \theta = -\sqrt{15}$$

$$\csc \theta \tan \theta = \frac{\sin \theta}{\cos \theta} \cdot \cos \theta$$

$$\csc \theta \tan \theta = \sin \theta$$

$$\csc \theta = \frac{\sin \theta}{\tan \theta} = \frac{1/4}{1/\sqrt{15}} = \frac{1}{4} \times \frac{\sqrt{15}}{1} = \frac{\sqrt{15}}{4}$$

flip for $\sec \theta = -4/\sqrt{15} = -4\sqrt{15}/15$

5) Find $\cos \theta$ and $\csc \theta$

if $\cot \theta = \frac{7}{3}$ and $\sin \theta < 0$.

(+)

(-)

* | 03

$$1 + \cot^2 \theta = \csc^2 \theta$$

$$1 + \left(\frac{7}{3}\right)^2 = \csc^2 \theta$$

$$1 + \frac{49}{9} = \csc^2 \theta$$

$$\frac{58}{9} = \csc^2 \theta$$

$$\pm \frac{\sqrt{58}}{3} = \csc \theta$$

$$\boxed{-\frac{\sqrt{58}}{3} = \csc \theta}$$

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

$$\cos \theta \cdot \tan \theta = \sin \theta$$

$$\cos \theta = \frac{\sin \theta}{\tan \theta} = \frac{-\frac{3}{\sqrt{58}}}{\frac{3}{7}} = \frac{-3}{\sqrt{58}} \cdot \frac{7}{3} = \frac{-7}{\sqrt{58}} = \boxed{\frac{-7\sqrt{58}}{58}}$$

Answers to 5.1

1) $-\frac{2\sqrt{21}}{21}$ and $-\frac{5}{2}$

2) $\frac{\sqrt{65}}{4}$ and $\frac{4}{7}$

3) $-\frac{\sqrt{29}}{5}$ and $\frac{\sqrt{29}}{2}$

4) $-\frac{4\sqrt{15}}{15}$ and $-\sqrt{15}$

5) $-\frac{7\sqrt{58}}{58}$ and $-\frac{\sqrt{58}}{3}$