

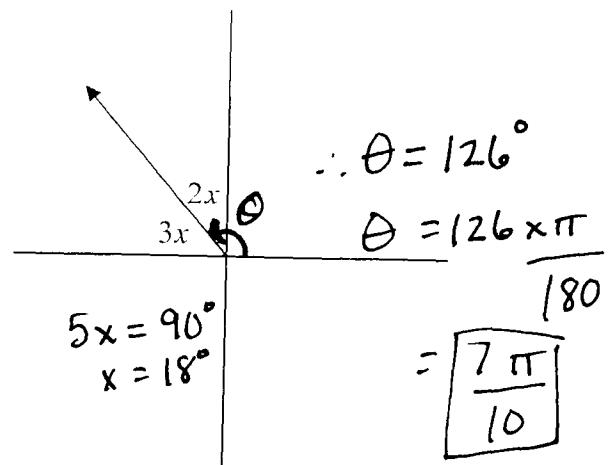
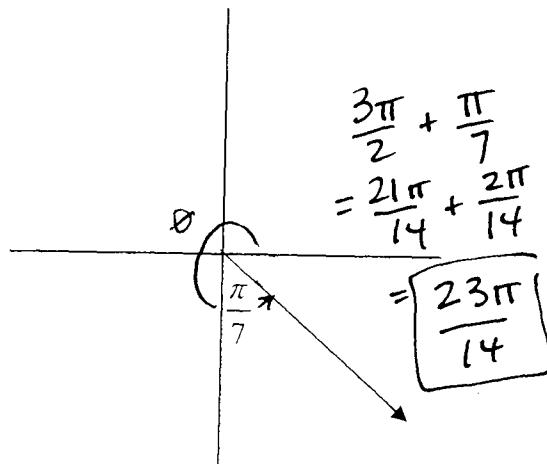
## MHF4U: Quiz – Trigonometric Values

Name: Solutions

Mark:  $\frac{14}{\text{KU}}$   $\frac{10}{\text{APP}}$   $\frac{5}{\text{TIPS}}$

1. Give the measure of the angle  $\angle \theta$ , (express in radians as a fraction of  $\pi$ ) [KU/3]

- A) [1] B) [2]



2. Determine a positive and negative co-terminal angle for each of the following: [KU/4]

A)  $133^\circ$

[2]  $133^\circ + 360^\circ = 493^\circ$

$133^\circ - 360^\circ = -227^\circ$

B)  $\frac{8\pi}{5}$

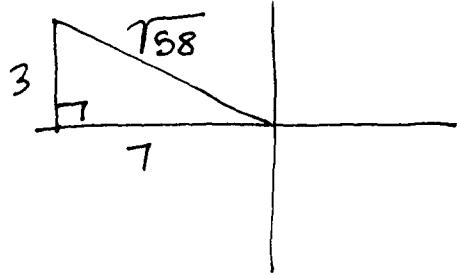
[2]  $\begin{aligned} \frac{8\pi}{5} + 2\pi &= \frac{18\pi}{5} \\ \frac{8\pi}{5} - 2\pi &= -\frac{2\pi}{5} \end{aligned}$

3. Determine the measure of the central angle that is formed by an arc length of 8.3 cm in a circle with a radius of 3.5 cm. Express the measure in both radians and degrees, correct to one decimal place. [APP/3]

$$\begin{aligned} \theta &= \frac{8.3}{3.5} \\ &= \underline{\underline{2.37 \text{ rads}}} \end{aligned}$$

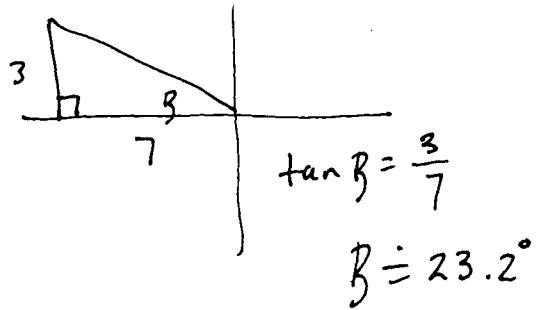
$$\begin{aligned} 2.37 \times \frac{180}{\pi} \\ &= \underline{\underline{135.9^\circ}} \end{aligned}$$

4. A) If the point  $P(-7, 3)$  is a point that lies on the terminal arm of  $\theta$ . Determine the exact value of  $\sec \theta$ . [APP/3]



$$\sec \theta = -\frac{\sqrt{58}}{7}$$

- B) Determine  $\angle \theta$ . (Express in radians, rounded to the nearest tenth.) [KU/1]



$$\tan \beta = \frac{3}{7}$$

$$\beta \doteq 23.2^\circ$$

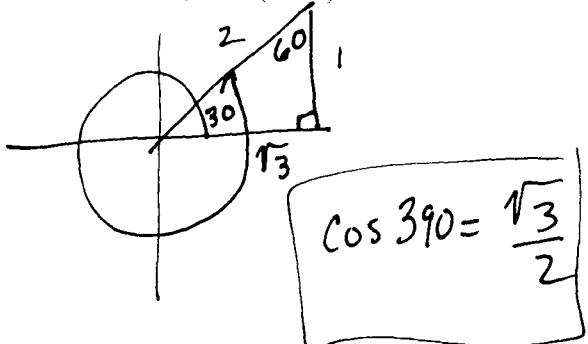
$$\therefore \theta \doteq 156.8^\circ$$

$$\theta = 156.8 \times \frac{\pi}{180}$$

$$\theta \doteq 2.74 \text{ rads}$$

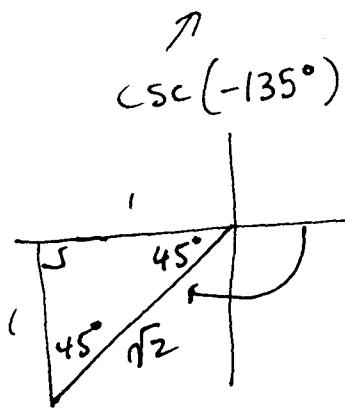
5. Evaluate each of the following. Include a detailed diagram for full marks. (No decimal answers allowed) [KU/6]

A)  $\cos(390^\circ)$



$$\cos 390^\circ = \frac{\sqrt{3}}{2}$$

B)  $\csc(-\frac{3\pi}{4})$



$$\csc(-135^\circ)$$

$$\csc(-135^\circ) = -\frac{\sqrt{2}}{1}$$

6. Determine all possible values of  $\angle \theta$  such that: (Consider  $-2\pi \leq \theta \leq 2\pi$ ) [APP/4]

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

$$\theta_1 = -60^\circ \rightarrow [300^\circ]$$

$$\theta_2 = 180 - (-60) \\ = [240^\circ]$$

$$\theta_3 = 300 - 360 \\ = [-60^\circ]$$

$$\theta_4 = 240 - 360 \\ = [-120^\circ]$$

$$\begin{array}{|c|c|} \hline \text{Rad} & \theta_1 = \frac{5\pi}{3} \quad \theta_3 = -\frac{\pi}{3} \\ & \theta_2 = \frac{4\pi}{3} \quad \theta_4 = -\frac{2\pi}{3} \\ \hline \end{array}$$

7. Given  $\angle \theta$  is a third quadrant angle and  $\cos \theta = -\frac{1}{2}$ . Determine the exact value (no decimals) of  $3 \csc \theta - (\tan \theta)^2$ . [TIPS / 5]

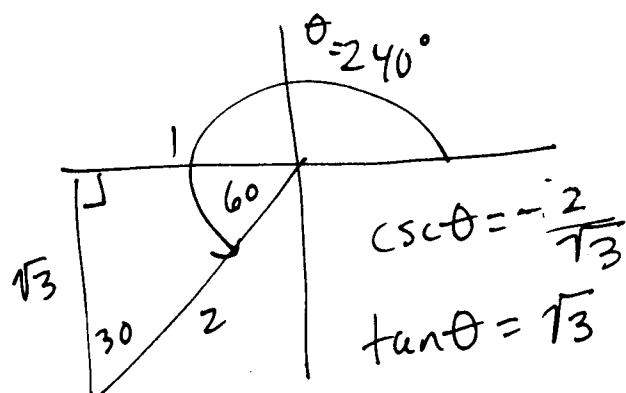
Find  $\theta$

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

$$\theta_1 = 120^\circ$$

$$\theta_2 = 360 - 120^\circ \\ = 240^\circ$$

Since  $\theta$  is  
a 3rd quad  
angle



$$\begin{aligned} \therefore 3 \csc \theta - (\tan \theta)^2 \\ = 3 \left(-\frac{2}{\sqrt{3}}\right) - (\sqrt{3})^2 \\ = 3 \left(-\frac{2\sqrt{3}}{3}\right) - 3 \\ = -2\sqrt{3} - 3 \end{aligned}$$