SM3 Unit9 Review Name:_____

For questions 1-3, please select radian measure θ:

1) Convert $50°$ to radians.

$$50 \cdot \frac{\pi}{180} = \frac{5\pi}{18}$$

2) Convert $585°$ to radians.

$$585 \cdot \frac{\pi}{180} = \frac{13\pi}{4}$$

3) Convert $-35°$ to radians.

$$-35 \cdot \frac{\pi}{180} = -\frac{7\pi}{36}$$

For questions 4-6, please select degree measure θ:

4) Convert $\frac{7\pi}{9}$ to degrees.

$$\frac{7\pi}{9} \cdot \frac{180}{\pi} = 140°$$

5) Convert $-\frac{\pi}{6}$ to degrees.

$$-\frac{\pi}{6} \cdot \frac{180}{\pi} = -30°$$

6) Convert $\frac{7\pi}{15}$ to degrees.

$$\frac{7\pi}{15} \cdot \frac{180}{\pi} = 84°$$

7) Which quadrant does the terminal side of $976°$ lie in?

$976°$ is 2 full rotations and $256°$ more.

3RD Quadrant

8) Which quadrant does the terminal side of $-\frac{11\pi}{5}$?

$-\frac{11\pi}{5}$ is close to $-\frac{10\pi}{5} = -2\pi$ which is one full rotation clockwise and another $-\frac{\pi}{5}$ more.

Fourth Quadrant

9) Find a positive and negative coterminal angle for $-87°$.

(Answers may vary, many options)

$$-87° - 360° = -447°$$
$$-87° + 360° = 273°$$

10) Find a positive and negative coterminal angle for $\frac{22\pi}{3}$.

$$\frac{22\pi}{3} - 2\pi = \frac{16\pi}{3}$$

Or keep subtracting 2π and you get $\frac{10\pi}{3}$ or $\frac{4\pi}{3}$

$$\frac{4\pi}{3} - 2\pi = -\frac{2\pi}{3}$$

11) What is the reference angle for $19°$?
The reference angle is an acute angle between $0°$ and $90°$ measured to the closes x-axis.
$19°$ is already closest to the positive x-axis , so $19°$ is the reference angle.

12) What is the reference angle for $-115°$?
$-115°$ is closest to the negative x-axis, so $180° - 115° = 65°$ is the reference angle.

13) What is the reference angle for $\frac{17\pi}{3}$?
$\frac{17\pi}{3}$ is close to $\frac{18\pi}{3} = 6\pi$ which would be 3 full rotations. So $\frac{17\pi}{3}$ is $\frac{\pi}{3}$ short of a full rotation. So the reference angle is $\frac{\pi}{3}$.

14) What is the reference angle for $-\frac{5\pi}{4}$?
$-\frac{5\pi}{4}$ is close to $-\frac{4\pi}{4} = -\pi$ which is half a rotation. So $-\frac{5\pi}{4}$ is $\frac{\pi}{4}$ of a rotation clockwise past the negative x-axis. So the reference angle is $\frac{\pi}{4}$.

For questions 5-15, please select the option that best answers the question.

15) $\sec\theta =$ reciprocal of $\cos\theta$

A $\frac{\cos\theta}{\sin\theta}$ B $\frac{\sin\theta}{\cos\theta}$ C $\frac{1}{\sin\theta}$ D $\frac{1}{\cos\theta}$

16) $\tan\theta =$

A $\frac{\cos\theta}{\sin\theta}$ B $\frac{\sin\theta}{\cos\theta}$ C $\frac{1}{\sin\theta}$ D $\frac{1}{\cos\theta}$

For the following, use the unit circle and $\sin\theta = y, \cos\theta = x, \csc\theta = \frac{1}{y}, \sec\theta = \frac{1}{x}, \tan\theta = \frac{y}{x}, \cot\theta = \frac{x}{y}$

17) Evaluate $\sin(150°)$

$\frac{1}{2}$

18) Evaluate $\cos(30°)$

$\frac{\sqrt{3}}{2}$

19) Evaluate $\cot(270°)$

$$\cot\theta = \frac{\cos\theta}{\sin\theta} = \frac{0}{-1} = 0$$

20) Evaluate $\csc(405°)$

$$\csc\theta = \frac{1}{\sin\theta}, 405° - 360° = 45°$$

$$\csc 405° = \csc 45° = \frac{1}{\sin 45°} = \frac{1}{\sqrt{2}/2} = 1 \cdot \frac{2}{\sqrt{2}} = \frac{2}{\sqrt{2}} \cdot \frac{\sqrt{2}}{\sqrt{2}} = \frac{2\sqrt{2}}{2} = \sqrt{2}$$

21) Evaluate $\sec\left(\frac{5\pi}{4}\right)$

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

$$\sec\frac{5\pi}{4} = \frac{1}{\cos\frac{5\pi}{4}} = \frac{1}{-\sqrt{2}/2} = -\sqrt{2}$$

22) Evaluate $\cot\left(-\frac{\pi}{3}\right)$

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

$$\cot -\frac{\pi}{3} = \frac{\cos -\frac{\pi}{3}}{\sin -\frac{\pi}{3}} = \frac{1/2}{-\sqrt{3}/2} = \frac{1}{2} \cdot \frac{2}{-\sqrt{3}} = \frac{1}{-\sqrt{3}} \cdot \frac{\sqrt{3}}{\sqrt{3}} = -\frac{\sqrt{3}}{3}$$

23) In the triangle, $BC = 4$, $AB = 7$. Evaluate $\sin\alpha$:

$\sin\alpha = \frac{4\sqrt{65}}{65}$

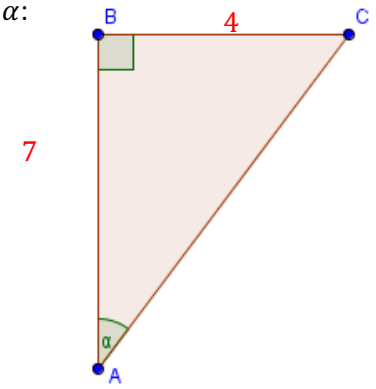
$\cos\alpha = \frac{7\sqrt{65}}{65}$

$\tan\alpha = \frac{4}{7}$

$\csc\alpha = \frac{\sqrt{65}}{4}$

$\sec\alpha = \frac{\sqrt{65}}{7}$

$\cot\alpha = \frac{7}{4}$



$a^2 + b^2 = c^2$

$4^2 + 7^2 = c^2$

$c^2 = 65$

$c = \sqrt{65}$