King Fahd University of Petroleum and Minerals
Faculty of Science – Math Prep Year program
Math 002 -042
Quiz #2 $\mathcal{A}$ (5.1-5.3)

Name: ID: **Sr#:** Sec.:

Solve each of the following questions completely. Put the final answer in the blank. (20 pts)

1. The **length of an arc** that subtends a central angle of $120°$ in a circle of diameter 12 cm is equal to _____.

Solution:

$$s = r\theta = 6(120 \times \frac{\pi}{180}) = 4\pi \text{ cm}$$

2. If a wheel with radius 10 centimeters is rotating at 100 revolutions per minute, then the **linear speed** of the wheel in centimeters per second is equal to _____.

Solution:

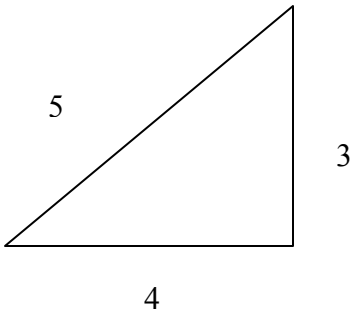
$$v = rw = 10 \times (100 \times \frac{2\pi}{60}) = \frac{100\pi}{3} cm/\sec$$

3. If $\sin\theta = \frac{-3}{5}$ and $\cos\theta > 0$, then $\tan\theta + \sec\theta$ is equal to

Solution:

$$\frac{3\pi}{2} < \theta < 4\pi$$

$$\therefore \tan\theta + \sec\theta = -\frac{3}{4} + \frac{5}{4} = \frac{2}{4} = \frac{1}{2}$$



4. If $\theta = -110°$, then **reference angle** θ' is equal to _____.

Solution:

$$\theta = -110° + 360° = 250° \Rightarrow \theta' = 250° - 180° = 70°$$

5. The exact value of $\sec(-300°) + \sin 210° + \tan(\frac{3\pi}{4})$ is equal to _____.

Solution:

$$= \sec 60° - \sin 30° + \tan 135°$$
$$= 2 - \frac{1}{2} - \tan 45°$$
$$= \frac{3}{2} - 1 = \frac{1}{2}$$

6. If the terminal side of an angle θ passes through the point $(-12, 5)$, then $\tan\theta + \sec\theta$ is equal to _____.

Solution:

$$\tan\theta + \sec\theta = -\frac{5}{12} - \frac{13}{12} = -\frac{18}{12} = -\frac{3}{2}$$

7. If $\alpha = 44° 15' 7''$, then the **supplement** of the angle α is _____.

Solution:

$$180° - 44°15'7'' = 135°44'53''$$

8. Two buildings are 40 meters apart. The angle of elevation from the top of the shorter building to the top of the taller building is $60°$. If the shorter building is 120 meters high, how high is the taller building?_____.

Solution:

See the notes