$\overline{\overline{40}}$

NAME:_____

SECTION A: Place the LETTER of your response in the space at the right.   13 pts

1.   Convert 160° to radians.   1._____

   A $\dfrac{9\pi}{16}$

   B $\dfrac{9\pi}{8}$

   C $\dfrac{8\pi}{9}$

   D $\dfrac{5\pi}{6}$

2.   If θ is a standard position angle measuring 8 rad, in which quadrant does the   2._____
     terminal arm of θ lie?

   A   Quadrant I

   B   Quadrant II

   C   Quadrant III

   D   Quadrant IV

3.   Which best approximates the value of cot(200°) + csc(3)?   3._____

   A   0.3273

   B   1.7374

   C   9.8336

   D   21.8548

4.   If $\cot(\theta) < 0$ and $sec(\theta) > 0$, in which quadrant does the terminal arm of angle θ 4._____
     lie?

   A   Quadrant I

   B   Quadrant II

   C   Quadrant III

   D   Quadrant IV

5.   Solve: $csc(x) + 2 = 0$, where $0 \leq x \leq \pi$ 5._____

   A $x = \dfrac{\pi}{3}$

   B $x = \dfrac{\pi}{6}$

   C $x = \dfrac{\pi}{3}, \ x = \dfrac{2\pi}{3}$

   D $x = \dfrac{\pi}{6}, \ x = \dfrac{5\pi}{6}$

6. If β is an angle in standard position with $\csc(\beta) = -\frac{25}{7}$ and $\tan(\beta) > 0$, which is true for $\sec(\beta)$ and the measure of β?

    6._____

A $\sec(\beta) = -\frac{25}{24}, \quad \beta = 196°$

B $\sec(\beta) = \frac{25}{24}, \quad \beta = 16°$

C $\sec(\beta) = -\frac{25}{24}, \quad \beta = 344°$

D $\sec(\beta) = \frac{25}{24}, \quad \beta = 164°$

7. Solve: $\csc^2(\alpha) = 1$, where $\alpha \in [0, 2\pi)$

    7._____

A $\alpha = \frac{\pi}{2}$

B $\alpha = \frac{\pi}{2}, \alpha = \frac{3\pi}{2}$

C $\alpha = 0$

D $\alpha = 0, \alpha = \pi$

8. A circle centered at the origin contains the point (-12, 16). What is the equation of this circle?

    8._____

A $x^2 + y^2 = 16$

B $x^2 + y^2 = 20$

C $x^2 + y^2 = 40$

D $x^2 + y^2 = 400$

9. What is the length of the arc intercepted by a central angle of 100° in a circle with radius 4.6 cm?

    9._____

A   1.28 cm

B   4.01 cm

C   6.92 cm

D   8.03 cm

10. Which pair of angles is coterminal?

    10._____

A $\frac{5\pi}{3} \text{ and } -\frac{5\pi}{3}$

B $-\frac{\pi}{3} \text{ and } \frac{2\pi}{3}$

C $\frac{5\pi}{6} \text{ and } -\frac{7\pi}{6}$

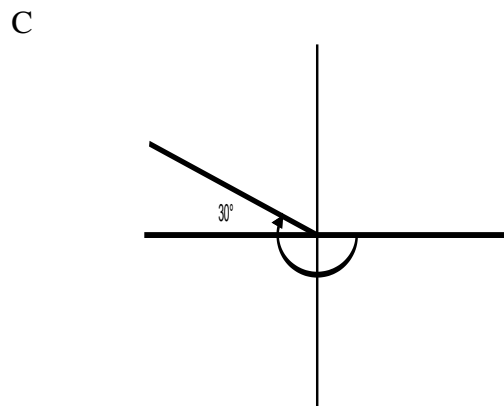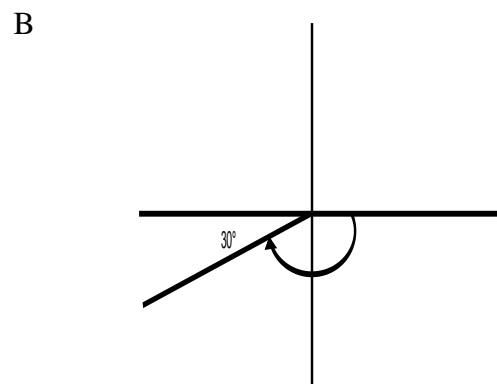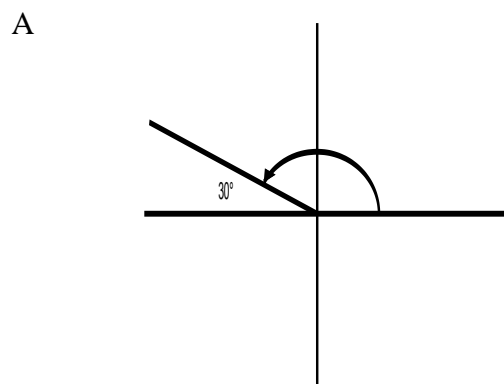D $\frac{2\pi}{3} \text{ and } \frac{4\pi}{3}$

11. What is the exact value of $\tan(30°) + \cot(30°)$ 11._____

     A   1

     B $\dfrac{4\sqrt{3}}{3}$

     C $\dfrac{2\sqrt{3}}{3}$

     D $\sqrt{3}$

12. Which represents an angle measuring $\dfrac{7\pi}{6}$?   12._____

     A   B

     C   D
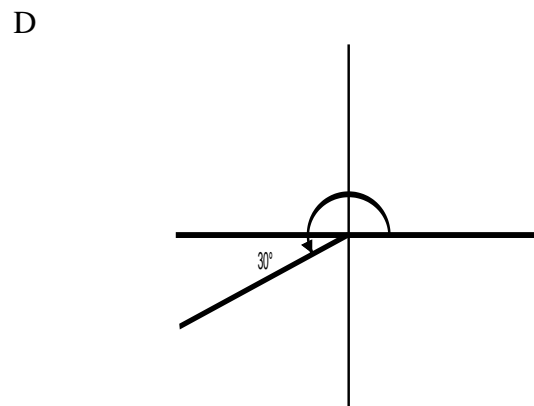
13. Which of the following points lies on the unit circle?   13._____

     A $\left(\dfrac{\sqrt{3}}{2}, -\dfrac{\sqrt{3}}{2}\right)$

     B $\left(\dfrac{1}{2}, \dfrac{1}{2}\right)$

     C $\left(\dfrac{3}{5}, -\dfrac{4}{5}\right)$

     D $\left(\dfrac{2}{3}, \dfrac{1}{3}\right)$

SECTION B: Answer ALL questions in the space provided. Full credit will only be awarded for correct solutions that include relevant workings.

1 The point (-4, 8) lies on the terminal arm of an angle, θ, in standard position. Sketch the angle in standard positon. Determine the exact value, in simplest radical form, for all six trigonometric ratios of θ. Calculate the measure of the reference angle, and determine the measure of θ.

6 pts

2. Determine the EXACT value, in simplest form, for $$\frac{\sin\left(-\frac{4\pi}{3}\right) + \sec\left(\frac{\pi}{4}\right)}{\tan(-120°)}$$

4 pts

3. Determine the general solution to the equation below, where x is in degrees.

6 pts

$$6\tan^2(x) - \tan(x) - 15 = 0$$

4. Solve for x, where $-\pi \le x < 2\pi$ $\qquad$ $sec^2(x) = 3\sec(x) - 2$ $\qquad$ 6 pts

5. On a circle with radius 6 cm, two points are described as follows: $\qquad$ 5 pts

    Point A is determined by rotating the point (6,0) through an angle of 3 radians.

    Point B is determined by rotating the point (0, -6) through an angle of -210°.

    What is the length of the longer arc joining A and B?