Mathematics 3200 In-Class Sample

Unit 4: Trigonometry and the Unit Circle Name:_____

Part A: Selected Response: Place the letter of the correct response in the space provided.

1. In which quadrant is $\sec > 0$ and $\sin < 0$? 1.____

(A) I
(B) II
(C) III
(D) IV

2. What is $460°$ in radian measure? 2. ____

(A) $\frac{9\pi}{23}$ (B) $\frac{23\pi}{18}$

(C) $\frac{23\pi}{9}$ (D) $\frac{18\pi}{23}$

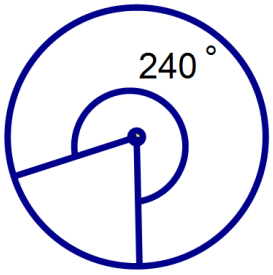
3. What is the length of the arc cut by a $240°$ in a circle having diameter 10 cm? 3.____

(A) $\frac{10\pi}{3}$

(B) $\frac{20\pi}{3}$

(C) $\frac{30\pi}{3}$

(D) $\frac{40\pi}{3}$



4. What is the smallest positive angle that has the same terminal arm as $-\frac{5\pi}{3}$? 4. ____

(A) $-\frac{\pi}{3}$ (B) $\frac{\pi}{3}$

(C) $\frac{\pi}{6}$ (D) $\frac{5\pi}{3}$

5. The point $P\left(-\frac{1}{3}, y\right)$ is on the unit circle and the terminal arm is in the 2nd quadrant. 5.____

What is the exact value of the missing co-ordinate?

(A) $\frac{\sqrt{10}}{3}$ (B) $\frac{2\sqrt{2}}{3}$

(C) $-\frac{\sqrt{10}}{3}$ (D) $-\frac{2\sqrt{2}}{3}$

6. What is the measure of the central angle if $P(\theta) = \left(-\frac{1}{2}, -\frac{\sqrt{3}}{2}\right)$? 6.____

(A) $\frac{5\pi}{6}$

(B) $\frac{7\pi}{6}$

(C) $\frac{4\pi}{3}$

(D) $\frac{2\pi}{3}$

7. If $\cot\theta = 0.6$, what is one approximate measure in radians for θ? 7.____

(A) 1.03
(B) 0.54
(C) 0.64
(D) 1.88

8. Which exact measures of θ satisfy $\sin\theta = 0$ where $-360° \le \theta < 360°$? 8.____

(A) $\theta = -360°, -180°, 0°, 180°, 360°$
(B) $\theta = -180°, 0°, 180°, 360°$
(C) $\theta = -360°, -180°, 0°, 180°$
(D) $\theta = -360°, -180°, 180°$

9. What is the exact value of $\tan\left(-\frac{7\pi}{3}\right)$ 9.____

(A) $-\frac{\sqrt{3}}{2}$ (B) $-\sqrt{3}$

(C) $\frac{\sqrt{3}}{3}$ (D) $\sqrt{3}$

10. Solve for x: $\cos x = \frac{\sqrt{3}}{2}$ 10.___

(A) $x = \frac{\pi}{6} + 2\pi k, k \varepsilon I$ and $x = \frac{11\pi}{6} + 2\pi k, k \varepsilon I$

(B) $x = \frac{5\pi}{6} + 2\pi k, k \varepsilon I$ and $x = \frac{7\pi}{6} + 2\pi k, k \varepsilon I$

(C) $x = \frac{2\pi}{3} + 2\pi k, k \varepsilon I$ and $x = \frac{4\pi}{3} + 2\pi k, k \varepsilon I$

(D) $x = \frac{\pi}{3} + 2\pi k, k \varepsilon I$ and $x = \frac{5\pi}{3} + 2\pi k, k \varepsilon I$

11. On the unit circle, how many radians would the point (-1, 0) pass if rotated counterclockwise until it first reaches $\left(\frac{\sqrt{3}}{2},-\frac{1}{2}\right)$. 11.___

(A) $\frac{11\pi}{6}$ (B) $\frac{2\pi}{3}$

(C) $\frac{5\pi}{6}$ (D) $\frac{5\pi}{3}$

Part B: Constructed Response: Show workings to receive full marks.

12. Determine the exact value of: $\cos\left(\frac{\pi}{4}\right)+\sin^2\left(-\frac{2\pi}{3}\right)\tan\left(\frac{\pi}{3}\right)$

13. Determine the exact value of : $\dfrac{\csc\left(\dfrac{5\pi}{3}\right)+\cot\left(\dfrac{7\pi}{6}\right)}{\sin(-150°)}$

14. Determine the approximate measure of the angles that satisfy the following:

$$\sin\theta = 0.54 \text{ where } -2\pi < \theta \leq \pi$$

15. Write the general solution for $\tan^2\theta = 4\tan\theta$ in radian measure.

16. Write the general solution for $3\sec^2\theta - \sec\theta - 4 = 0$ in degree measure.