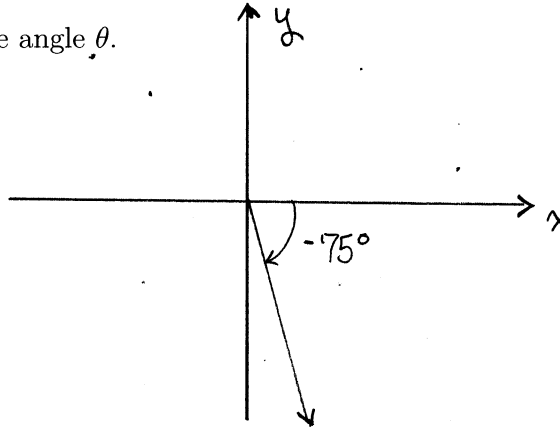**Math 130 - Quiz 1**

August 21, 2019

Name ___key___

Score _____

Show all work to receive full credit. Supply explanations when necessary. You must work individually on this quiz. The quiz is due August 26.

1. (5 points) The angle θ is in standard position and measures $-75°$.

   (a) Roughly sketch the angle θ.

   (b) Starting with θ, determine the degree measures of two coterminal angles.

   $$360° + (-75°) = \boxed{285°}$$

   $$285° + 360° = \boxed{645°}$$

   (c) Convert your answers above to radian measure. Write in terms of π.

   $285°$: $\dfrac{285°}{360°} = \dfrac{X}{2\pi} \Rightarrow \boxed{X = \dfrac{19\pi}{12}}$

   $645°$: $2\pi + \dfrac{19\pi}{12}$

   $= \boxed{\dfrac{43\pi}{12}}$

2. (2 points) An angle is obtuse if its degree measure is strictly between $90°$ and $180°$. Write these boundary angles in radians.

   $$90° = \dfrac{\pi}{2} \text{ RAD}$$

   $$180° = \pi \text{ RAD}$$

3. (2 points) A large circular track has a $1200\,m$ radius. Find the distance traveled by a person who sprints for $3/4$ of the track.

   $\dfrac{3}{4}$ OF TRACK

   $\Rightarrow$ ANGLE IS $\dfrac{3\pi}{2}$

   DISTANCE = ARC LENGTH

   $= (1200)\left(\dfrac{3\pi}{2}\right)$

   $= \boxed{1800\pi \ m}$

   $\approx 5654.9\,m$

RADIUS IS 6CM

4. (2 points) A Blu-ray disc is about 12 cm in diameter. In a Blu-ray player, it will rotate at 10,000 revolutions per minute.

(a) Find the angular speed of the disc.

$$\frac{10,000 \text{ REVOLUTIONS}}{\text{PER MIN}} = \frac{(10000)(360°) \text{ PER MIN}}{}$$

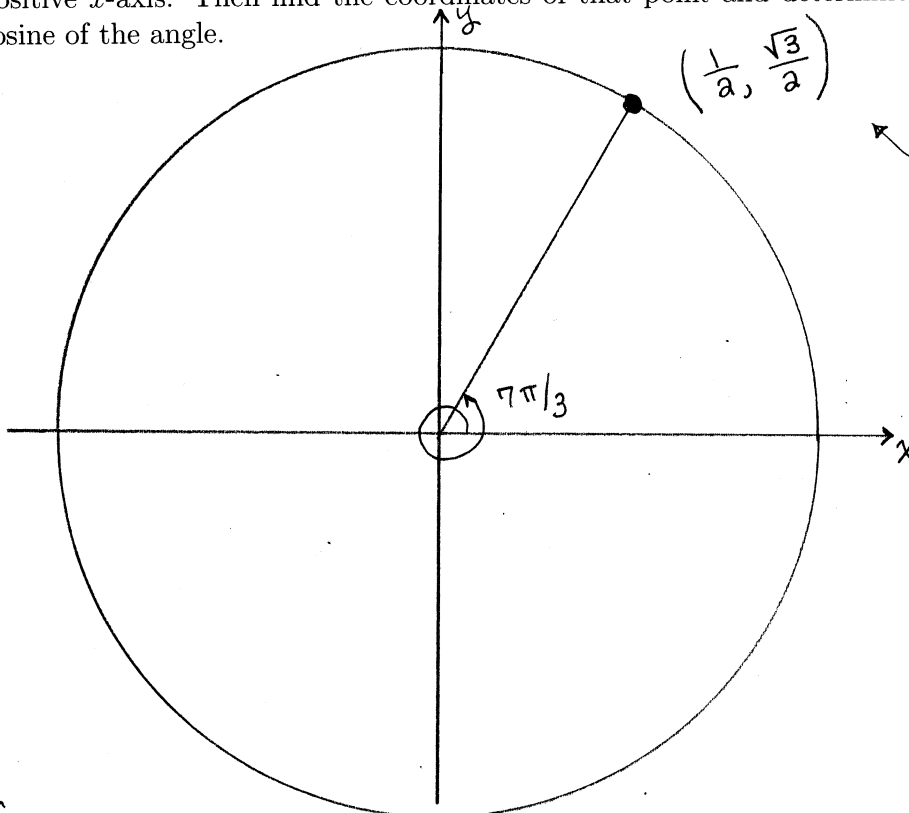$$= (10,000)(2\pi) \text{ RAD PER MIN}$$

$$= \boxed{20,000 \pi \text{ RAD}/\text{MIN}}$$

(b) Find the linear speed of a point on the edge of the disc.

$$\left(20,000 \pi \text{ RAD}/\text{MIN}\right)\left(6 \text{ CM}\right)$$

$$= 120,000 \pi \text{ CM}/\text{MIN}$$

$$\approx \boxed{376,991 \text{ CM}/\text{MIN}}$$

5. (4 points) Roughly sketch a unit circle on a rectangular coordinate system and mark the approximate point on the circle that makes an angle of $7\pi/3$ radians with the positive x-axis. Then find the coordinates of that point and determine the sine and cosine of the angle.

$$\left(\frac{1}{2}, \frac{\sqrt{3}}{2}\right)$$

$7\pi/3$

FROM OUR UNIT CIRCLE.

$$\text{SIN } \frac{7\pi}{3} = \frac{\sqrt{3}}{2}$$

$$\text{COS } \frac{7\pi}{3} = \frac{1}{2}$$