Name_____ Date_____ Period_____

TEST: 5.1 – 5.3—Calculator Permitted
Angles, angle measure, applications of angles, & Circular Functions.

Part I: Multiple Choice

_____ 1. Which of the following angles is coterminal with $\frac{-45049\pi}{4}$?

(A) $\frac{\pi}{4}$ (B) $\frac{3\pi}{4}$ (C) $\frac{5\pi}{4}$ (D) $\frac{7\pi}{4}$ (E) $\frac{3\pi}{2}$

_____ 2. The angle $\frac{6\pi}{19}$ expressed in degrees, minutes, seconds is

(A) $570^{o}0'0''$ (B) $178^{o}34'29.065''$ (C) $56^{o}50'31.579''$ (D) $18^{o}5'36.255''$ (E) $181^{o}26'11.886''$

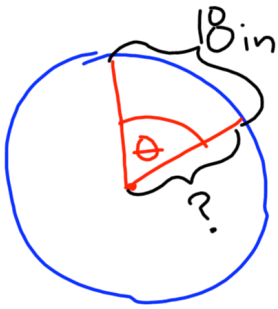
_____ 3. For $\theta = 276.798^{o}$, Find the reference angle, θ_{ref}

(A) 6.798^{o} (B) 83.202^{o} (C) 273.656^{o} (D) 276.798^{o} (E) $\frac{\pi}{6}$

_____ 4. The angle $\theta = -47845168^{o}$ terminates in which quadrant?

(A) I (B) II (C) III (D) IV (E) on an axis

_____ 5. As shown in the diagram at right, find the radius of a circle if an arc length of 18 inches is subtended by a central angle of $\theta = \frac{3\pi}{10}$.



(A) $\frac{60}{\pi}$ in (B) $\frac{30}{\pi}$ in (C) $\frac{120}{\pi}$ in (D) $\frac{1}{3}$ in (E) 3in

_____ 6. Find the arc length of a circle of radius 14 feet subtended by a central angle of 39°.

(A) $\frac{39}{14}$ ft (B) 1092 ft (C) 546 ft (D) $\frac{91\pi}{60}$ ft (E) $\frac{91\pi}{30}$ ft

_____ 7. The radius of a car wheel is 15 inches. How many revolutions per minute (rpm) is the wheel making when the car is travelling at 30 mph? Round your answer to the nearest rpm.

(A) 9 rpm (B) 336 rpm (C) 2101 rpm (D) 3318 rpm (E) 4215 rpm

_____ 8. The minute hand of a clock is 9 inches long. What distance does its tip move in 19 minutes?

(A) $\frac{57\pi}{10}$ in (B) $\frac{57\pi}{20}$ in (C) $\frac{19\pi}{270}$ in (D) $\frac{19\pi}{540}$ in (E) 19 in

_____ 9. A pizza slice from a 20-inch diameter pizza has a central angle of 35°. What is the area, in square inches, of this slice?

(A) 700 (B) $\frac{7\pi}{36}$ (C) $\frac{350\pi}{9}$ (D) $\frac{35\pi}{18}$ (E) $\frac{175\pi}{18}$

Part II: Free Response

Show all work below. Avoid intermediate rounding error. Box your final answers, with units when appropriate.

10. If $\sec\theta = -3$ and $\csc\theta < 0$

(a) Draw the reference triangle for θ in the correct quadrant. Show your arc and angle θ.

(b) Find the **simplified, exact, rationalized** value of $\cos\theta$.

(c) Find the **simplified, exact, rationalized** value of $\cot\theta$.

(d) Find the reference angle, θ_{ref}, for θ in degrees. **Show the equation you are solving** and report 3 decimals.

(e) To three decimals, find the value of θ such that $\theta \in \left[0^o, 360^o\right)$. Show the computations that lead to your answer.

(f) If ϕ is a coterminal angle to θ such that $\phi = \theta - (45)\left(360^o\right)$, what is the **simplified, exact value** of $\sec\phi$?