1. Convert $320^{\circ}$ to radian measure. (in exact form)
2. Convert $\frac{4 \pi}{19}$ radians to degree measure. (3 decimal places)

Round answers to the nearest thousandth.
3. Find the measure of the central angle (in both radians and in degrees) that has an 15 cm arc length and a 6 cm radius.
4. Find the length of arc below.

5) Find the length of arc below:
$r=12 \mathrm{in}, \theta=\frac{3 \pi}{4}$
6. State if the given angles are coterminal. (show work)
a) $285^{\circ}, 645^{\circ}$
b) $\frac{17 \pi}{9},-\frac{10 \pi}{9}$
7) Find a coterminal angle between $0^{\circ}$ and $360^{\circ}$ for the angle below. $-435^{\circ}$
8) Find a coterminal angle between 0 and $2 \pi$ for given angle below.
$-\frac{35 \pi}{18}$
9. State the quadrant for the terminal side of each angle. Then, find the measure of its reference angle ( $\theta^{\prime}$ )

| a) $167^{\circ}$ | Quadrant: | b) $-375^{\circ}$ | Quadrant: |
| :---: | :---: | :---: | :---: |
| $\theta^{\prime}=$ |  | $\theta^{\prime}=$ |  |
| c) $\frac{15 \pi}{11}$ | Quadrant: | d) $-\frac{11 \pi}{10}$ | Quadrant: |
| $\theta^{\prime}=$ |  | $\theta^{\prime}=$ |  |

