Question 1. *A circle with radius of* $63.010\mu m$ *is centered at the origin of a CCS. Angles* α *and* β *are in standard position,* $\alpha = 1.100$ *radians, and* $\beta = 1.257$ *radians.*

(a) What is the length of the arc that is captured between α *and* β*?*

(b) To the nearest degree, what is the size of the angle between the terminal side of α *and the terminal side of* β*?*

Solution. (a) The arc between α and β connects the endpoints of the terminal sides of α and β. Therefore, it subtends the angle $\beta - \alpha = 1.257 - 1.1 = 0.157$ radians. Thus, the length of this arc is

$$(\beta - \alpha)R = 0.157 \cdot 63.010 \approx 9.89\mu m.$$

(b) We have calculated above that this angle is $\beta - \alpha = 0.157$ radians. It only remains to express this angle measure in degrees:

$$0.157\, radians = 0.157 \cdot \frac{180^{\circ}}{\pi} \approx 9^{\circ}.$$

Answer:

(a) $\approx 9.89\mu m$.

(b) $\approx 9^{\circ}$.

□