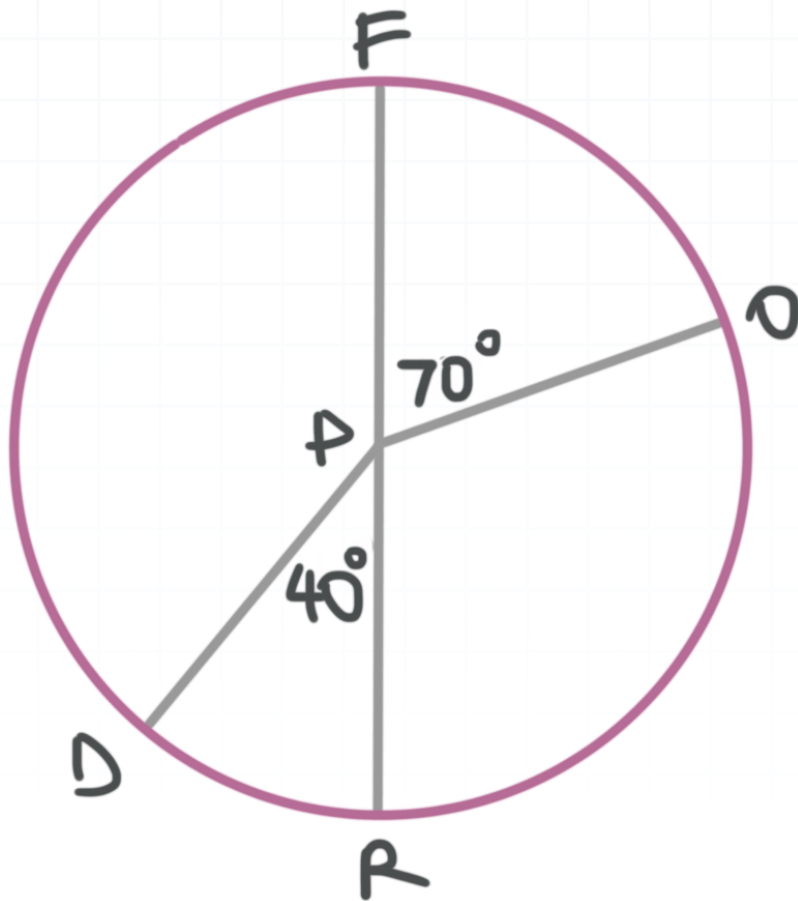


Topic: Degree measure of an arc

Question: \overline{FR} is a diameter of the circle (with center at P). What is the sum of the measures of \widehat{RO} and \widehat{FD} ?

**Answer choices:**

- A 110°
- B 140°
- C 250°
- D 360°



Solution: C

\overline{FR} is a diameter, so the sum of the measures of \widehat{RO} and \widehat{OF} is 180° .

$$m\widehat{RO} + m\widehat{OF} = 180^\circ$$

$$m\widehat{RO} + 70^\circ = 180^\circ$$

$$m\widehat{RO} = 110^\circ$$

Likewise, the sum of the measures of \widehat{FD} and \widehat{DR} is 180° .

$$m\widehat{FD} + m\widehat{DR} = 180^\circ$$

$$m\widehat{FD} + 40^\circ = 180^\circ$$

$$m\widehat{FD} = 140^\circ$$

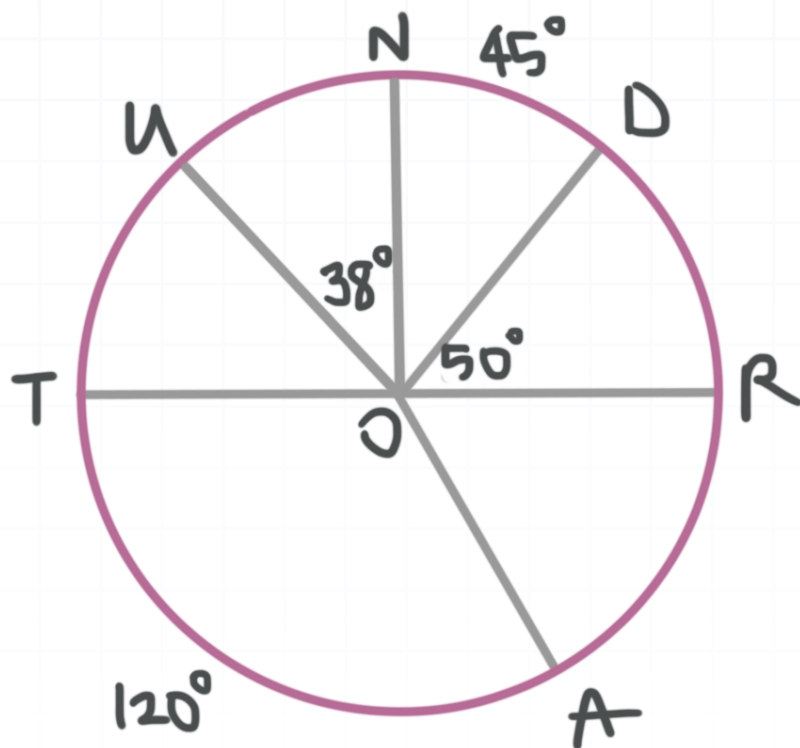
The sum of the measures of arcs \widehat{RO} and \widehat{FD} is

$$110^\circ + 140^\circ = 250^\circ$$



Topic: Degree measure of an arc

Question: \overline{TR} is a diameter of the circle (with center at O) in the figure. What is the difference between the measures of \widehat{AR} and \widehat{UT} ?

**Answer choices:**

- A 82°
- B 38°
- C 22°
- D 13°



Solution: D

\overline{TR} is a diameter, so the sum of the measures of \widehat{TA} and \widehat{AR} is 180° .

$$m\widehat{TA} + m\widehat{AR} = 180^\circ$$

$$120^\circ + m\widehat{AR} = 180^\circ$$

$$m\widehat{AR} = 60^\circ$$

Likewise, the sum of the measures of \widehat{RU} and \widehat{UT} is 180° , and the measure of \widehat{RU} can be written as the sum of the measures of arcs \widehat{RD} , \widehat{DN} , and \widehat{NU} . Therefore,

$$m\widehat{RU} + m\widehat{UT} = 180^\circ$$

$$(m\widehat{RD} + m\widehat{DN} + m\widehat{NU}) + m\widehat{UT} = 180^\circ$$

$$(50^\circ + 45^\circ + 38^\circ) + m\widehat{UT} = 180^\circ$$

$$133^\circ + m\widehat{UT} = 180^\circ$$

$$m\widehat{UT} = 47^\circ$$

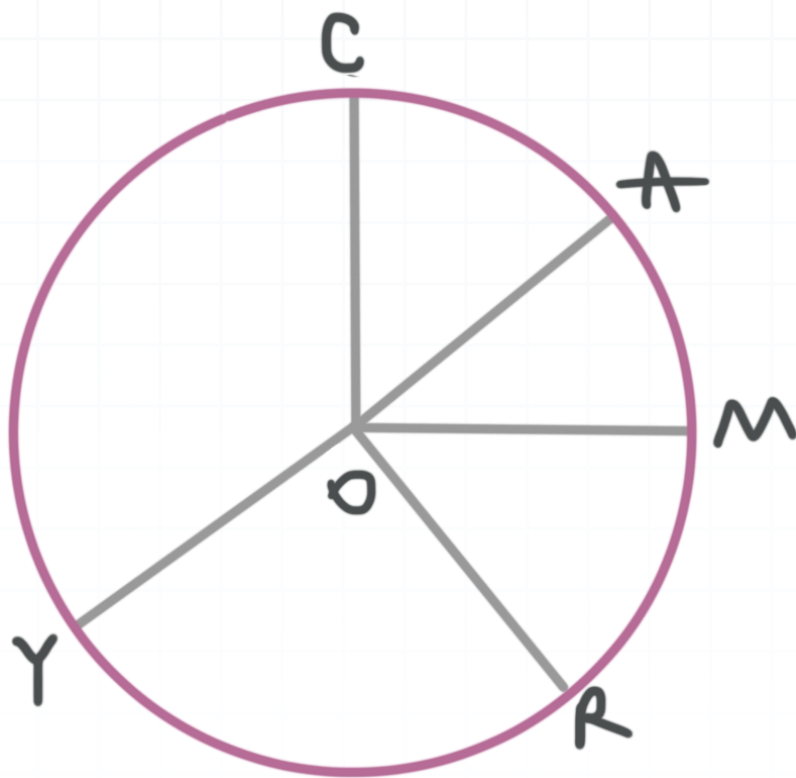
The difference between the measures of \widehat{AR} and \widehat{UT} is

$$60^\circ - 47^\circ = 13^\circ$$



Topic: Degree measure of an arc

Question: Angles $\angle MOC$ and $\angle ROA$ are right angles. $m\angle MOA = 40^\circ$ and $m\angle YOR = 100^\circ$. Which arc has the largest measure?



Answer choices:

- A \widehat{RC}
- B \widehat{YRC}
- C \widehat{YMA}
- D \widehat{MCY}



Solution: B

Use the fact that $\angle MOA = 40^\circ$, and that $\angle MOC$ and $\angle ROA$ each have measure 90° , to figure out that $\angle AOC$ and $\angle ROM$ each have measure 50° .

Now you know the measures of the following four central angles: $\angle YOR$, $\angle ROM$, $\angle MOA$, and $\angle AOC$.

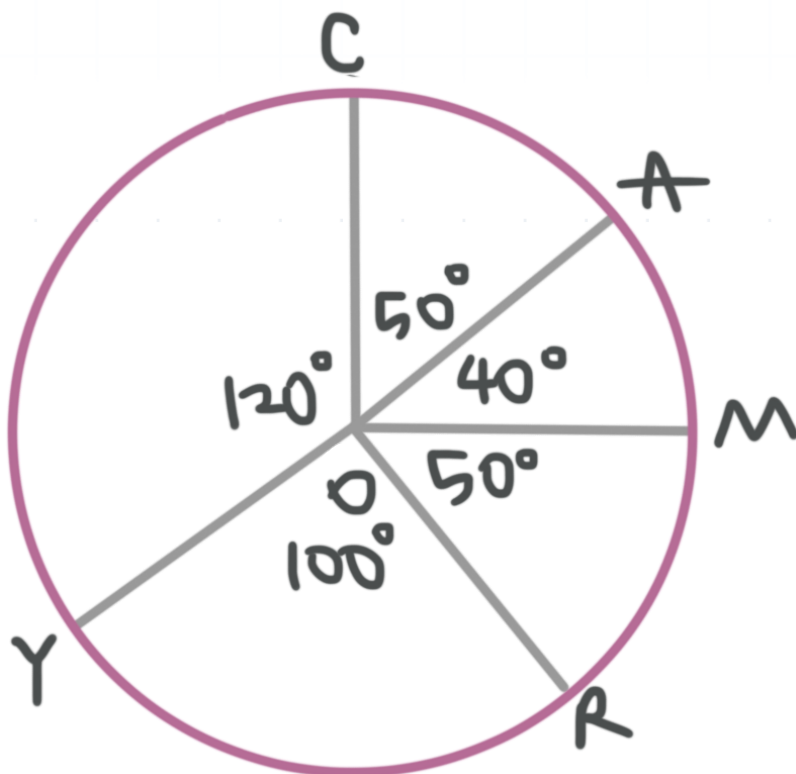
$$m\angle YOR = 100^\circ$$

$$m\angle ROM = 50^\circ$$

$$m\angle MOA = 40^\circ$$

$$m\angle AOC = 50^\circ$$

Subtract their total (240°) from 360° to get $m\angle COY = 120^\circ$.



Knowing the measures of those five central angles, you can figure out the measures of the arcs given as the answer choices.



$$m\widehat{RC} = 50^\circ + 40^\circ + 50^\circ = 140^\circ$$

$$m\widehat{YRC} = 100^\circ + 50^\circ + 40^\circ + 50^\circ = 240^\circ$$

$$m\widehat{YMA} = 100^\circ + 50^\circ + 40^\circ = 190^\circ$$

$$m\widehat{MCY} = 40^\circ + 50^\circ + 120^\circ = 210^\circ$$

Of these, \widehat{YRC} has the largest measure.

