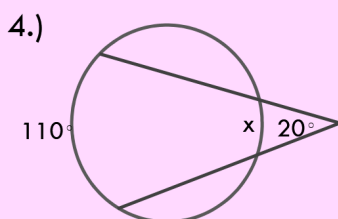
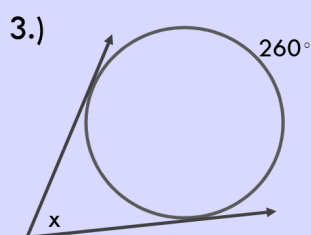
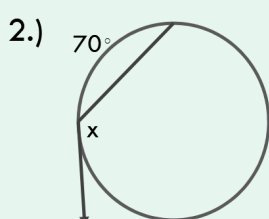
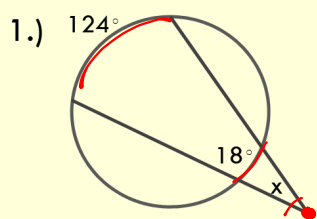


Good morning!

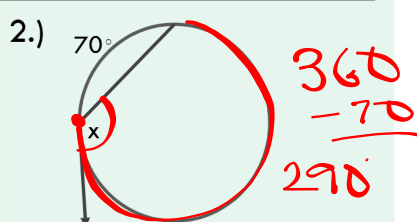
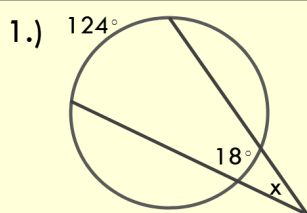
1. "Here"
2. Quiz opens tomorrow!
3. Notes on Arc Length
4. Practice
5. DeltaMath for homework

Warm up: Solve for x



$\angle_{out} = \frac{BIG - small}{2}$
 $x = \frac{124 - 18}{2}$
 $x = \frac{106}{2}$
 $x = 53$

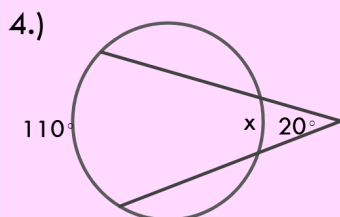
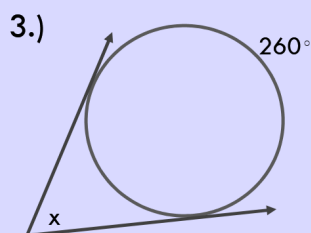
Warm up: Solve for x



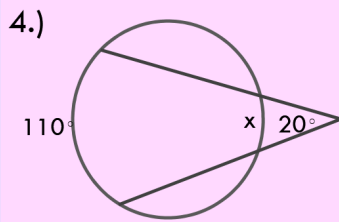
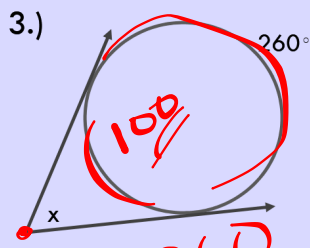
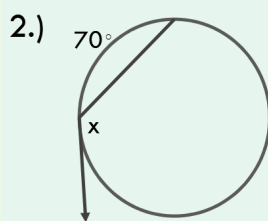
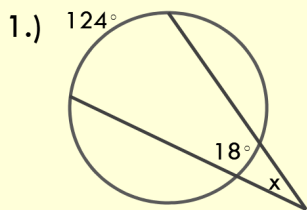
$\angle \text{inscribed} = \frac{\text{arc}}{2}$

$x = \frac{290}{2}$

$x = 145^\circ$



Warm up: Solve for x



$$\begin{array}{r} 360 \\ - 260 \\ \hline 100 \end{array}$$

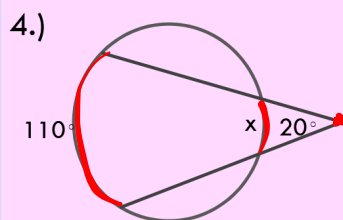
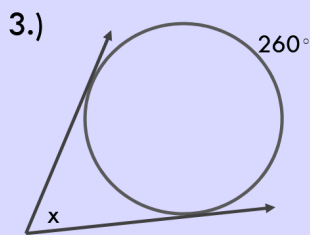
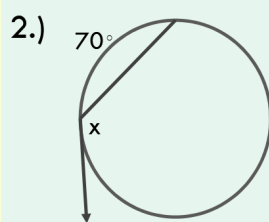
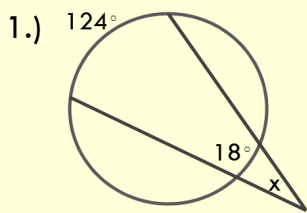
$$\angle_{out} = \frac{\widehat{B1G} - \widehat{small}}{2}$$

$$x = \frac{260 - 100}{2}$$

$$x = \frac{160}{2}$$

$$x = 80^\circ$$

Warm up: Solve for x



$$\angle_{out} = \frac{360 - \text{small}}{2}$$

$$2 \cdot 20 = \frac{110 - x}{2} \cdot 2$$

$$40 = 110 - x$$

$$-110 \quad -110$$

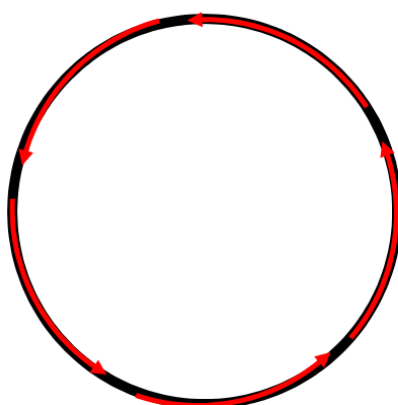
$$-70 = -x$$

$$x = 70^\circ$$

Circumference & Arc Length of Circles

Circumference

The distance around a circle




"the belt"

Circumference

$$C = 2\pi r$$

or

$$C = \pi d$$


2 Types of Answers

Rounded

- Type the Pi button on your calculator
- Toggle your answer
- Do NOT write Pi in your answer

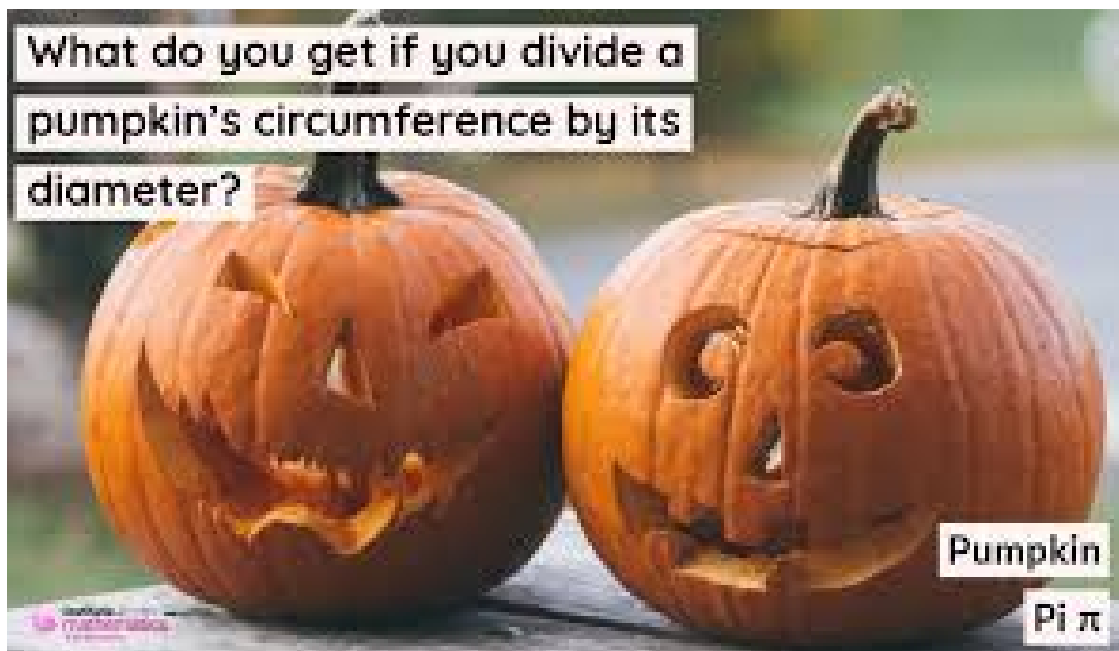
Exact

- Pi will be in your answer

• Take care of numbers first

• Save pi for dessert

decimal...



Find the EXACT circumference.

1. $r = 14$ feet

$$C = 2\pi r$$

$$C = 2\pi(14)$$

$$C = 28\pi \text{ feet}$$

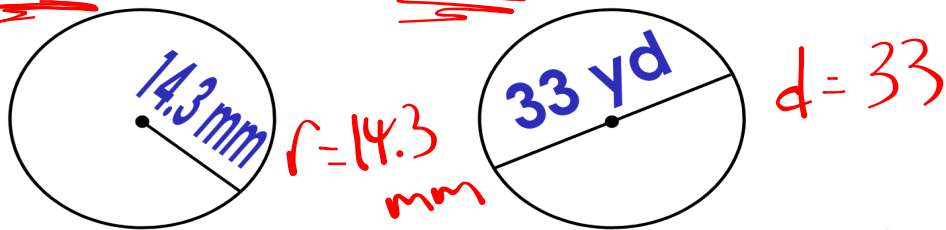
2. $d = 15$ miles

$$C = \pi d$$

$$C = \pi(15)$$

$$C = 15\pi \text{ mi.}$$

Ex 3 and 4: Find the circumference.
Round to the nearest tenths.



$$C = 2\pi r$$
$$= 2 * \pi * 14.3$$

$$C = 89.8 \text{ mm}$$

$$C = \pi d$$
$$C = \pi * 33$$

$$C = 103.7 \text{ yd}$$

5. A circular flower garden has a radius of 3 feet. Find the circumference of the garden to the nearest hundredths.

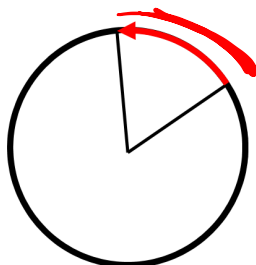
$$C = 2\pi r$$

$$= 2\pi(3)$$

$$C = 18.85 \text{ ft}$$

Arc Length

The *distance* along the curved line making the arc (NOT a degree amount)

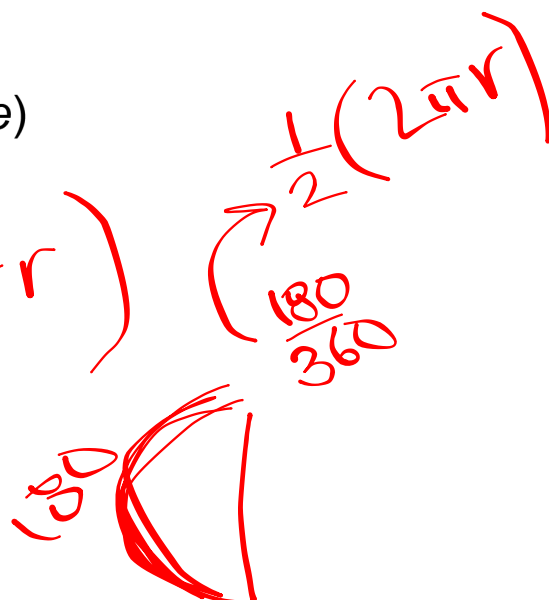


"pie crust"

Arc Length

$$\text{Arc length} = \frac{\theta}{360} (\text{Circumference})$$

$$AL = \frac{\theta}{360} (2\pi r)$$



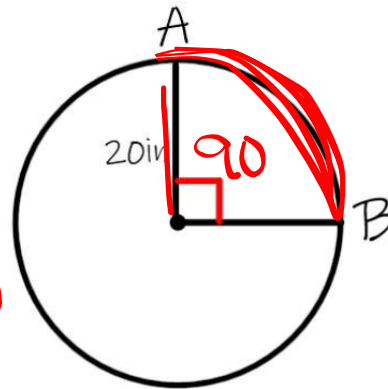
Let's Try this Together: Find the
Exact ArcLength Of \widehat{AB} !

$$AL = \frac{\theta}{360} (2\pi r)$$

$$\frac{90}{360} (2\pi (20))$$

$$\frac{1}{4} (2 * 20 \pi)$$

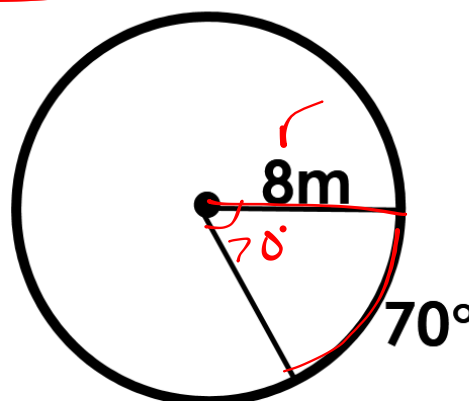
$$\frac{40}{4} \pi = \boxed{10\pi \text{ in}}$$



Ex 6. Find the Arc Length
Round to the nearest hundredths

$$AL = \frac{\theta}{360} (2\pi r)$$
$$= \frac{70}{360} * 2 * \pi * 8$$

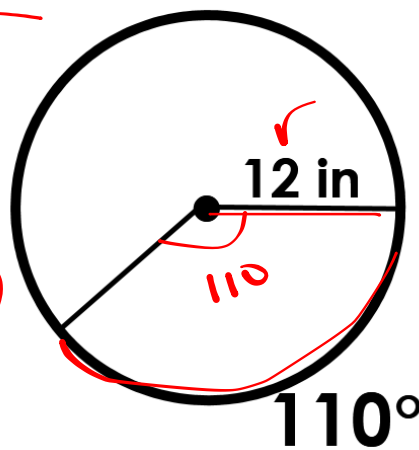
$$AL = 9.77 \text{ m}$$



Ex 7. Find the Arc Length
Round to the nearest hundredths

$$AL = \frac{\theta}{360} (2\pi r)$$
$$= \frac{110}{360} (2 * \pi * 12)$$

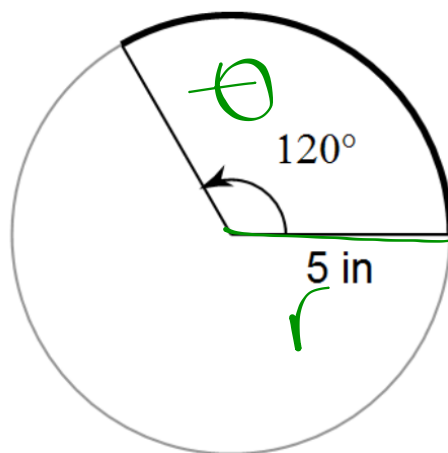
$$AL = 23.04 \text{ in}$$



Ex 8. Find the exact Arc Length.

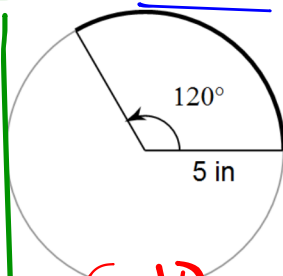
$$\begin{aligned}AL &= \frac{\theta}{360} (2\pi r) \\ &= \frac{120}{360} (2 * 5) \pi\end{aligned}$$

$$AL = \frac{10}{3} \pi \text{ in}$$



Ex 9. What happens to the arc length if the radius were to be doubled? Halved?

Linear relationship



$$r = 5$$

$$AL = \frac{\theta}{360} (2\pi r)$$

$$= \frac{120}{360} * 2 * \pi * 5$$

$$= 10.47 \text{ in}$$

$$r = 10$$

$$= \frac{120}{360} * 2 * \pi * 10$$

$$= 20.94 \text{ in}$$

$$r = 2.5$$

$$= \frac{120}{360} * 2 * \pi * 2.5$$

$$= 5.24 \text{ in}$$

doubled!

halved!

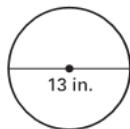
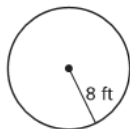
Name _____

Date _____

LESSON 11.1 Practice
 For use with the lesson "Circumference and Arc Length"

Use the diagram to find the indicated measure.

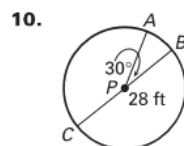
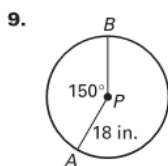
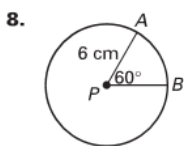
1. Find the circumference.
2. Find the circumference.
3. Find the radius.



Find the indicated measure.

4. The exact radius of a circle with circumference 42 meters
5. The exact diameter of a circle with circumference 39 centimeters
6. The exact circumference of a circle with diameter 15 inches
7. The exact circumference of a circle with radius 27 feet

Find the length of \widehat{AB} .



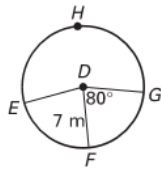
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Name _____

Date _____

LESSON 11.1 Practice *continued*
For use with the lesson "Circumference and Arc Length"

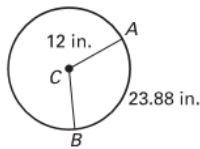
In $\odot D$ shown below, $\angle EDF \cong \angle FDG$. Find the indicated measure.



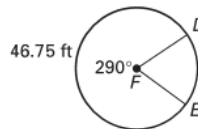
- 11. $m\widehat{EFG}$
- 12. $m\widehat{EHG}$
- 13. Length of \widehat{EFG}
- 14. Length of \widehat{EHG}
- 15. $m\widehat{EHF}$
- 16. Length of \widehat{FEG}

Find the indicated measure.

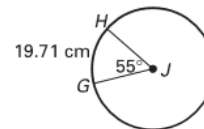
17. $m\widehat{AB}$



18. Circumference of $\odot F$

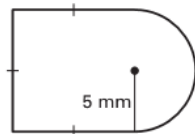


19. Radius of $\odot J$

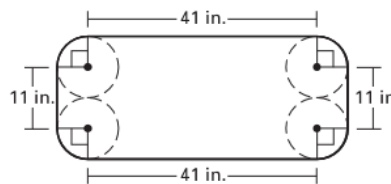


Find the perimeter of the region.

- 20.



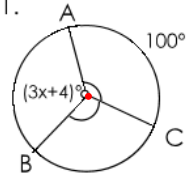
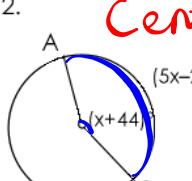
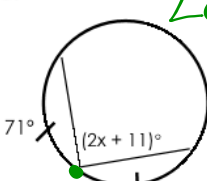
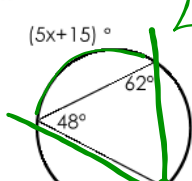
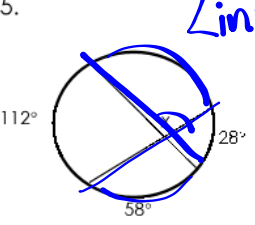
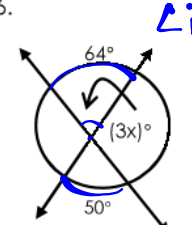
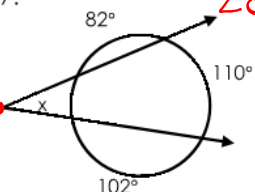
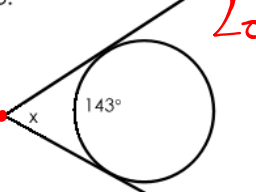
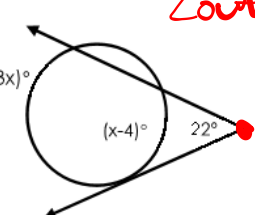
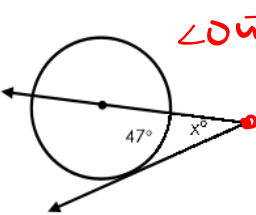
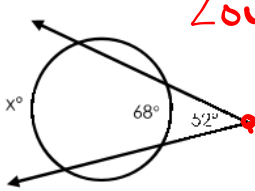
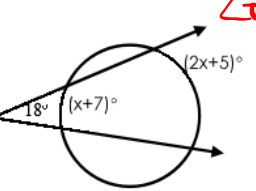
- 21.



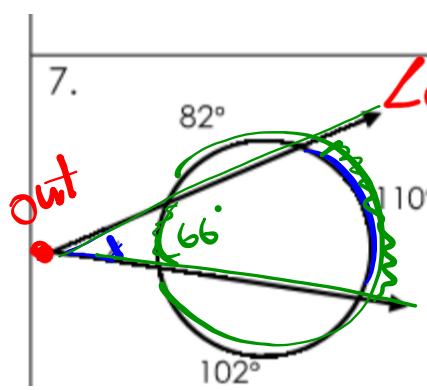
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<p>1.  Central \angle</p>	<p>2.  Central \angle</p>
<p>3.  $\angle_{in} = \frac{arc}{2}$</p>	<p>4.  $\angle_{in} = \frac{arc}{2}$</p>
<p>5.  $\angle_{inside} = \frac{arc + arc}{2}$</p>	<p>6.  $\angle_{inside} = \frac{arc + arc}{2}$</p>
<p>7.  $\angle_{out} = \frac{BIG - small}{2}$</p>	<p>8.  $\angle_{out} = \frac{BIG - small}{2}$</p>
<p>9.  $\angle_{out} = \frac{BIG - small}{2}$</p>	<p>10.  $\angle_{out} = \frac{BIG - small}{2}$</p>
<p>11.  $\angle_{out} = \frac{BIG - small}{2}$</p>	<p>12.  $\angle_{out} = \frac{BIG - small}{2}$</p>

7.



$\angle_{out} = \frac{\widehat{BIG} - \widehat{Small}}{2}$

$x = \frac{110 - 66}{2}$

$x = \frac{44}{2}$

$x = 22^\circ$

$$\begin{array}{r} 360 \\ -82 \\ -110 \\ -102 \\ \hline 66 \end{array}$$

5.

$L_{\text{inside}} = \frac{\text{arc} + \text{arc}}{2}$

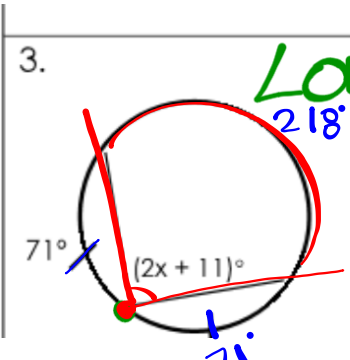
$X = \frac{162 + 58}{2}$

$= \frac{220}{2}$

$X = 110^\circ$

$$\begin{array}{r} 360 \\ - 112 \\ - 58 \\ - 28 \\ \hline 162 \end{array}$$

3.



$\text{Lon} = \frac{\text{arc}}{2}$

$\text{Lon} = \frac{\text{arc}}{2}$

$2x + 11 = \frac{218}{2}$

$2x + 11 = 109$

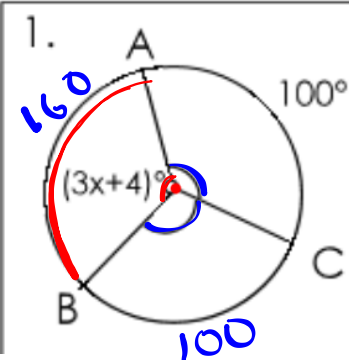
$\frac{2x}{2} = \frac{98}{2}$

$x = 49$

360
- 71
- 71

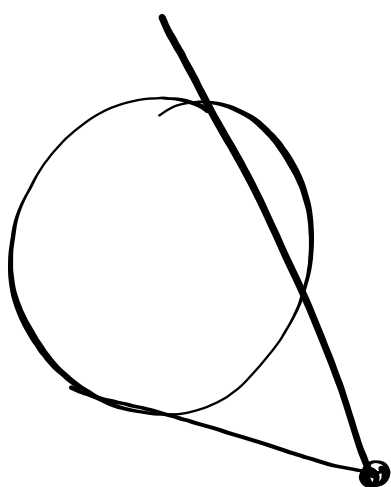
218

1.



Central $\angle = \text{arc}$

$$3x + 4 = 160$$
$$\begin{array}{r} -4 \quad -4 \\ \hline 3x = 156 \end{array}$$
$$\frac{3x}{3} = \frac{156}{3}$$
$$x = 52$$



$\angle_{\text{central}} \quad \angle_{\text{central}} = \widehat{\text{arc}}$
 $\angle_{\text{ON}} \quad \angle_{\text{ON}} = \frac{\widehat{\text{arc}}}{2}$
 $\angle_{\text{out}} \quad \angle_{\text{out}} = \frac{BK_{\text{small}}}{2}$
 $\angle_{\text{inside}} \quad \angle_{\text{inside}} = \frac{\widehat{\text{arc}} + \widehat{\text{arc}}}{2}$

