

# Arc Length-Sector Area

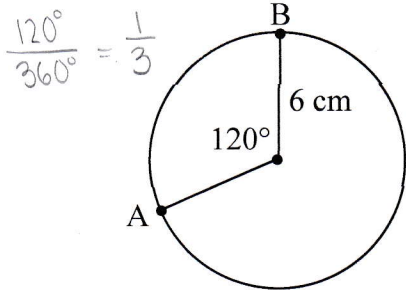
Name: Key

Wells Worksheet (W2)

Date: \_\_\_\_\_

Block: \_\_\_\_\_

1. Find the length of arc  $AB$ .



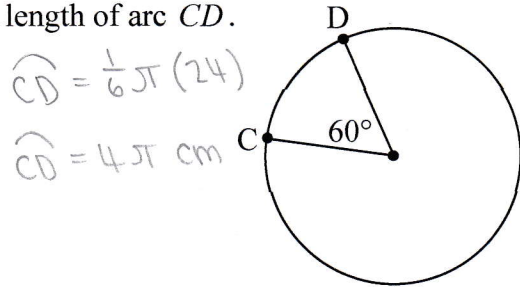
$$\frac{120^\circ}{360^\circ} = \frac{1}{3}$$

$$\widehat{AB} = \frac{1}{3} \pi (12)$$

$$\widehat{AB} = 4\pi \text{ cm}$$

Arc: 4π cm

2. The diameter is 24 cm. Find the length of arc  $CD$ .



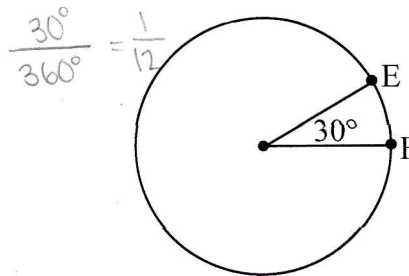
$$\widehat{CD} = \frac{1}{6} \pi (24)$$

$$\widehat{CD} = 4\pi \text{ cm}$$

$$\frac{60^\circ}{360^\circ} = \frac{1}{6}$$

Arc: 4π cm

3. The length of arc  $EF$  is  $5\pi$  in. Find the length of the radius.



$$\frac{30^\circ}{360^\circ} = \frac{1}{12}$$

$$\widehat{EF} = 5\pi \text{ in}$$

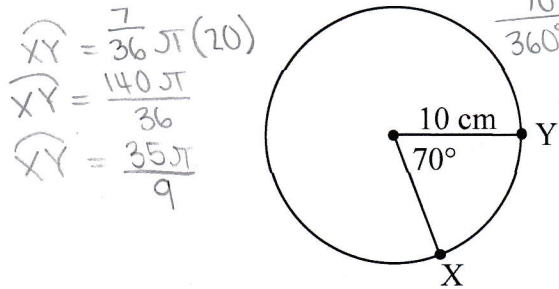
$$\frac{5\pi}{\pi} = \frac{1}{12} (2) \pi r$$

$$(6)5 = \frac{1}{6} r (6)$$

$$30 = r$$

Radius: 30 in

4. Find the length of arc  $XY$ .



$$\widehat{XY} = \frac{7}{36} \pi (20)$$

$$\widehat{XY} = \frac{140\pi}{36}$$

$$\widehat{XY} = \frac{35\pi}{9}$$

$$\frac{70^\circ}{360^\circ} = \frac{7}{36}$$

Arc:  $\frac{35\pi}{9}$  cm

5. A circle has an arc whose measure is  $80^\circ$  and whose length is  $88\pi$ . What is the diameter of the circle?

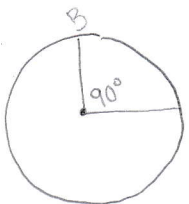
$$\frac{80^\circ}{360^\circ} = \frac{2}{9}$$

$$\frac{88\pi}{\pi} = \frac{2}{9} \pi (d)$$

$$\left(\frac{9}{2}\right)88 = \frac{2}{9} d \left(\frac{9}{2}\right)$$

$$396 = d$$

6. A circle has a circumference whose length is  $25\pi$ . Find the length of an arc whose central angle is  $90^\circ$ .

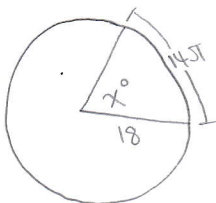


$$\frac{90^\circ}{360^\circ} = \frac{1}{4}$$

$$\widehat{AB} = \frac{1}{4} (25\pi)$$

$$\widehat{AB} = \frac{25\pi}{4} \text{ units}$$

7. Find the measure of the central angle of an arc if its length is  $14\pi$  and the radius is 18.



$$14\pi = \frac{x}{360} 2\pi (18)$$

$$\frac{14\pi}{\pi} = \frac{36x}{360} \pi$$

$$14 = \frac{36x}{360}$$

$$(10)(14) = \frac{x}{10} (10)$$

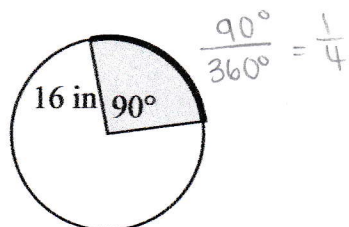
$$140 = x$$

# Arc Length-Sector Area

Name: \_\_\_\_\_

8. Calculate the sector area:

a.

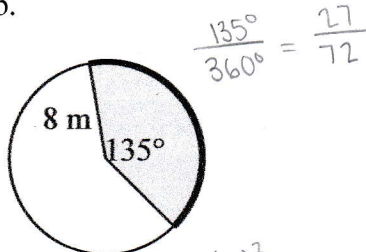


$$\frac{90^\circ}{360^\circ} = \frac{1}{4}$$

$$A = \frac{1}{4} \pi (16)^2$$

$$A = 64 \pi \text{ m}^2$$

b.

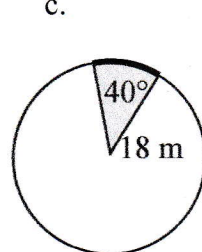


$$\frac{135^\circ}{360^\circ} = \frac{27}{72}$$

$$A = \frac{27}{72} \pi (8)^2$$

$$A = \frac{1728}{72} \pi = 24 \pi \text{ m}^2$$

c.



$$\frac{40^\circ}{360^\circ} = \frac{1}{9}$$

$$A = \frac{1}{9} \pi (18)^2$$

$$A = \frac{1}{9} (324) \pi$$

$$A = 36 \pi \text{ m}^2$$

9. The area of a circle is  $225\pi$  square inches. Find the area of the sector whose central angle is  $45^\circ$ .

$$\frac{45^\circ}{360^\circ} = \frac{1}{8}$$

$$A = \frac{1}{8} (225\pi)$$

$$A = \frac{225\pi}{8} \text{ in}^2$$

10. The central angle of a sector is  $60^\circ$  and the area of the circle is  $144\pi$ . What is the area of the sector?

$$\frac{60^\circ}{360^\circ} = \frac{1}{6}$$

$$A = \frac{1}{6} (144\pi)$$

$$A = 24 \pi \text{ in}^2$$

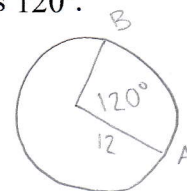
11. A circle has a radius of 12. Find the area of the sector whose central angle is  $120^\circ$ .

$$\frac{120^\circ}{360^\circ} = \frac{1}{3}$$

$$A = \frac{1}{3} \pi (12)^2$$

$$A = \frac{1}{3} (144) \pi$$

$$A = 48 \pi \text{ in}^2$$



12. Find the radius of a circle which has a sector area of  $9\pi$  whose central angle is  $90^\circ$ .

$$\frac{90^\circ}{360^\circ} = \frac{1}{4}$$

$$9\pi = \frac{1}{4} \pi r^2$$

$$(4)9 = \frac{1}{4} r^2 (4)$$

$$\sqrt{36} = \sqrt{r^2} \rightarrow r = 6$$

13. The central angle of a sector is  $72^\circ$  and the sector has an area of  $5\pi$ . Find the radius.

$$\frac{72^\circ}{360^\circ} = \frac{1}{5}$$

$$5\pi = \frac{1}{5} \pi r^2$$

$$(5)5 = \frac{1}{5} r^2 (5)$$

$$\sqrt{25} = \sqrt{r^2} \rightarrow r = 5$$

14. Find the measure of the central angle of a sector if its area is  $5\pi$  and the radius is 6.

$$5\pi = \frac{x}{360^\circ} \pi (6)^2$$

$$5 = \frac{36x}{360}$$

$$(10)5 = \frac{x}{10} (10) \rightarrow x = 50^\circ$$