Topic: Area of a circular sector

Question: If a circle has radius 5, find the area A of a sector that subtends a central angle of $135°$.

Answer choices:

A $A = \frac{75}{8}$

B $A = \frac{75\pi}{8}$

C $A = \frac{5{,}625}{2}$

D $A = \frac{5{,}625\pi}{2}$

Solution: B

Convert the central angle from degrees to radians.

$$135^\circ\left(\frac{\pi}{180^\circ}\right)=\frac{3\pi}{4}$$

Then the area of the circular sector is

$$A=\frac{1}{2}r^2\theta$$

$$A=\frac{1}{2}(5)^2\left(\frac{3\pi}{4}\right)$$

$$A=\frac{75\pi}{8}$$

Topic: Area of a circular sector

Question: Find the area A (in square centimeters) of the sector of a circle of radius 6 centimeters if that sector is bounded by an arc that subtends a central angle of $7\pi/4$ radians.

Answer choices:

A $A = \frac{63\pi}{2}$

B $A = \frac{63}{2}$

C $A = \frac{7\pi}{2}$

D $A = 7\pi$

Solution: A

The area of the circular sector is

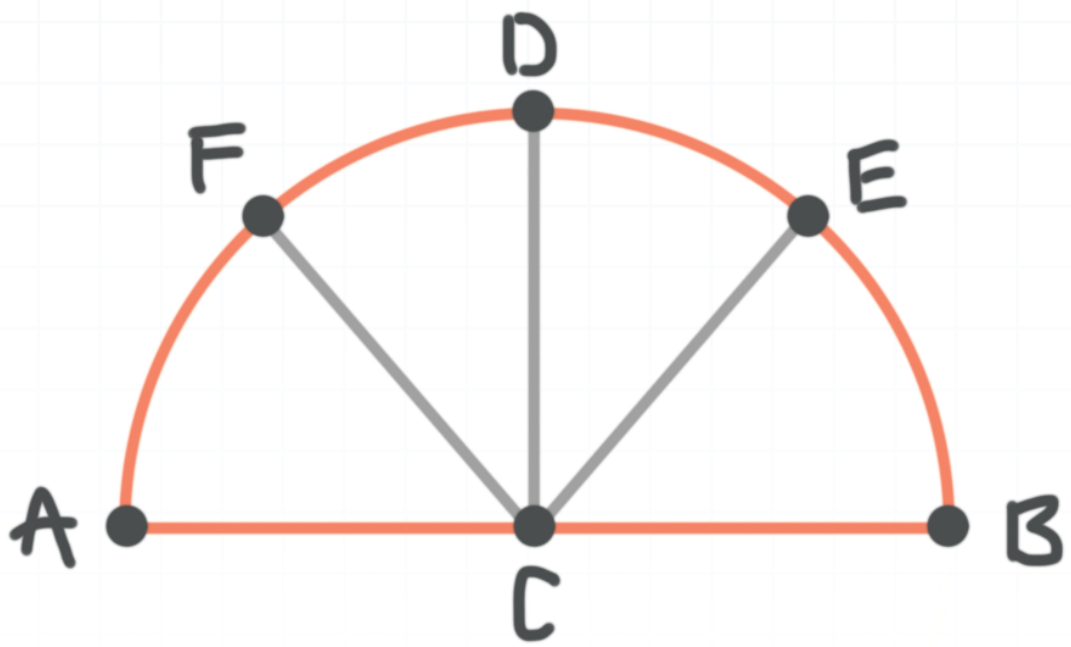
$$A = \frac{1}{2}r^2\theta$$

$$A = \frac{1}{2}(6)^2\left(\frac{7\pi}{4}\right)$$

$$A = \frac{63\pi}{2}$$

Topic: Area of a circular sector

Question: A semicircular window is shown below. If the window contains four stained glass sections of equal size and has a base length of 28 centimeters, what is the area of each stained glass section?



Answer choices:

A 49π

B 24.5π

C 73.5π

D 98π

Solution: B

The window is semicircular, so $\angle ACB = 180^\circ = \pi$. We can find the area of the whole window, and then divide it into four equal parts.

Since the base is 28 centimeters long, the diameter of the circle is 28 cm and the radius is $28/2 = 14$ cm.

The area of the circular sector is

$$A = \frac{1}{2}r^2\theta$$

$$A = \frac{1}{2}(14)^2(\pi)$$

$$A = 98\pi$$

The area of one stained glass section will be

$$A_1 = \frac{98\pi}{4}$$

$$A_1 = 24.5\pi$$