Topic: Area of a circle

Question: What is the diameter of a circle with an area of 8π?

Answer choices:

A $\sqrt{2}$

B $2\sqrt{2}$

C $3\sqrt{2}$

D $4\sqrt{2}$

Solution: D

The formula for the area of a circle is $A = \pi r^2$, and the area is 8π. Therefore,

$$\pi r^2 = 8\pi$$

Dividing both sides by π gives

$$r^2 = 8$$

$$r = \sqrt{8}$$

$$r = \sqrt{4} \cdot \sqrt{2}$$

$$r = 2\sqrt{2}$$

Since $r = 2\sqrt{2}$, and the diameter d is double the radius, we get

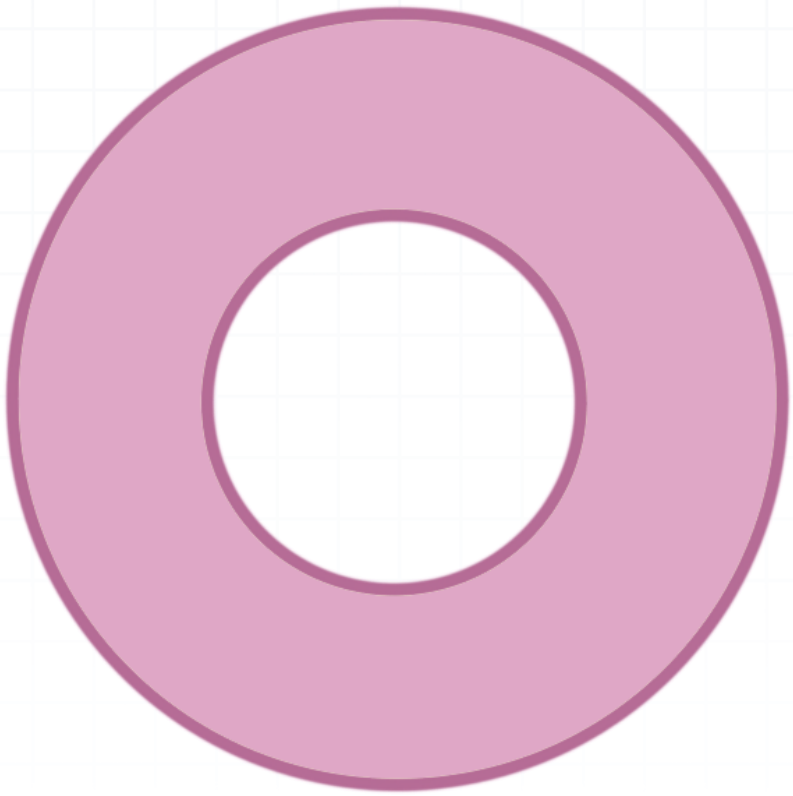
$$d = 2r$$

$$d = 2 \cdot 2\sqrt{2}$$

$$d = 4\sqrt{2}$$

Topic: Area of a circle

Question: The radius of the outer circle is 4 ft and the radius of the inner circle is 2 ft. What is the area of the shaded region?



Answer choices:

A 2π ft^2

B 6π ft^2

C 12π ft^2

D 16π ft^2

Solution: C

To get the area of the shaded region, you need to find the area of the outer circle and subtract from it the area of the inner circle.

For the outer circle:

$$A = \pi \cdot (4 \text{ ft})^2 = 16\pi \text{ ft}^2$$

For the inner circle:

$$A = \pi \cdot (2 \text{ ft})^2 = 4\pi \text{ ft}^2$$

Therefore, the area of the shaded region is

$$16\pi \text{ ft}^2 - 4\pi \text{ ft}^2 = 12\pi \text{ ft}^2$$

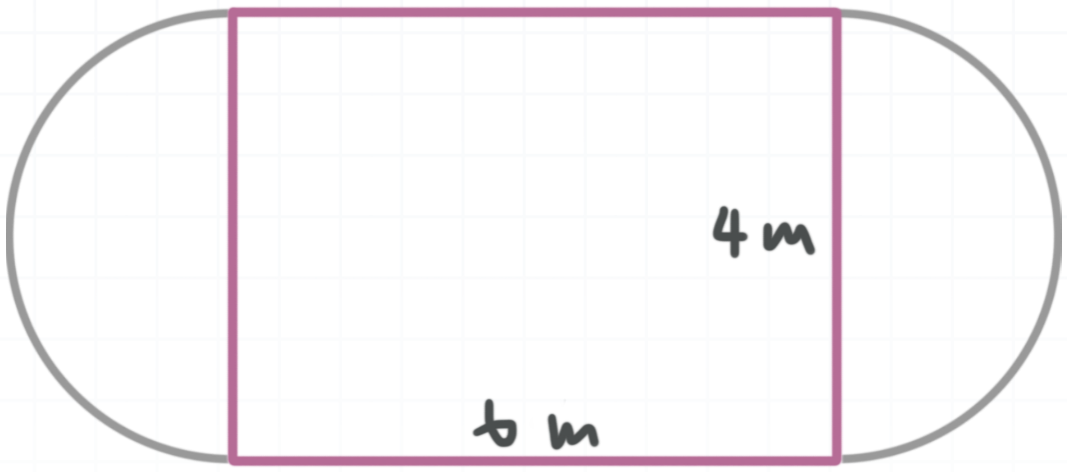
As a side note, 12π is the exact value of the answer, but if you wanted only an approximate value, you could use 3.14 as an approximation of π:

$$\text{area} \approx (12 \cdot 3.14) \text{ ft}^2$$

$$\text{area} \approx 37.68 \text{ ft}^2$$

Topic: Area of a circle

Question: The figure shows a 4 m by 6 m rectangle with a semicircle on each end. What is the area of the figure?



Answer choices:

A $(4\pi + 24)$ m^2

B 24π m^2

C $(16\pi + 24)$ m^2

D 28π m^2

Solution: A

You can see that the diameter of each semicircle is 4 m, so the radius of each is 2 m.

Two semicircles add up to one complete circle, so we need to add the area of one circle of radius 2 m and a rectangle with dimensions 4 m by 6 m.

For the circle:

$$A = \pi r^2 = \pi \cdot (2 \text{ m})^2 = 4\pi \text{ m}^2$$

For the rectangle:

$$A = lw = (4 \text{ m})(6 \text{ m}) = 24 \text{ m}^2$$

Therefore, the area of the given figure is $(4\pi + 24)$ m^2.

You could also find the approximate value using $\pi \approx 3.14$.

$$\text{area} \approx [(4 \cdot 3.14) + 24] \text{ m}^2$$

$$\text{area} \approx (12.56 + 24) \text{ m}^2$$

$$\text{area} \approx 36.56 \text{ m}^2$$