EUREKA MATH™ TIPS FOR PARENTS

KEY CONCEPT OVERVIEW

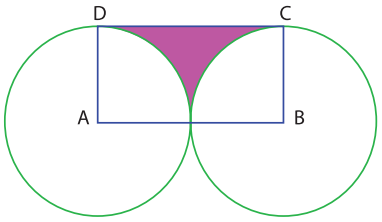
Topic D revisits area. In the first lesson, students complete real-world problems involving area. In subsequent lessons, students continue to calculate the areas of different shapes, including shapes with circular regions and missing sections. In the final two lessons of the topic, students' learning extends to surface area. Finally, students calculate the surface area of three-dimensional figures with missing sections.

You can expect to see homework that asks your child to do the following:

- Find the areas of familiar polygons and composite figures.
- Use area to determine the amount of supplies (e.g., paint, carpet) needed to complete a project.
- Create drawings to show that two expressions are equivalent when applying the distributive property.
- Use the distributive property to multiply expressions.
- Calculate the area of the shaded region of various figures, including those with circular regions.
- Determine the surface areas of various figures.

SAMPLE PROBLEMS *(From Lessons 22 and 24)*

1. The vertices A and B of rectangle $ABCD$ are centers of circles, each with a radius of 5 inches.



a. Find the exact area of the shaded region.

$$A_{\text{rectangle}} = 10 \text{ in.} \cdot 5 \text{ in.} = 50 \text{ in}^2$$

$$A_{\text{semicircle}} = \frac{1}{2}\pi(5 \text{ in.})^2 = \frac{25\pi}{2} \text{ in}^2$$

$$A_{\text{shaded area}} = \left(50 - \frac{25\pi}{2}\right) \text{in}^2$$

The exact area of the shaded region is $\left(50 - \frac{25\pi}{2}\right) \text{in}^2$.

b. Find the approximate area of the shaded region, using $\pi \approx \frac{22}{7}$.

$$A_{\text{shaded area}} = \left(50 - \frac{25\pi}{2}\right) \text{in}^2$$

$$A_{\text{shaded area}} \approx \left(50 - \frac{25}{2}\left(\frac{22}{7}\right)\right) \text{in}^2$$

$$A_{\text{shaded area}} \approx \left(50 - \frac{275}{7}\right) \text{in}^2$$

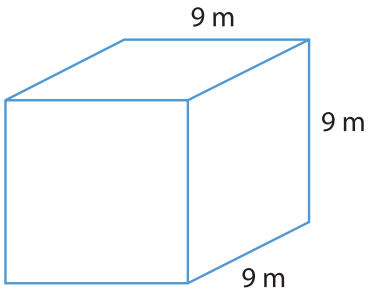
$$A_{\text{shaded area}} \approx 10\frac{5}{7} \text{ in}^2$$

The area of the shaded region is approximately $10\frac{5}{7} \text{ in}^2$.

SAMPLE PROBLEMS *(continued)*

2. Determine the surface area of each figure.

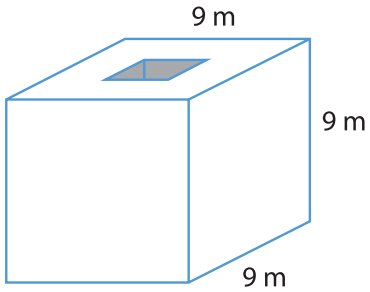
a.



$SA = 6s^2$
$= 6(9 \text{ m})^2$
$= 6(81 \text{ m}^2)$
$= 486 \text{ m}^2$

The surface area of the cube is 486 m².

b. A square hole with 3-meter side lengths has been cut through the cube. Find the new surface area of the cube, including the surface area of the lateral sides of the hole.



Surface area of lateral sides of the hole $= 4(9 \text{ m} \cdot 3 \text{ m}) = 108 \text{ m}^2$

Surface area of cube with holes $= 486 \text{ m}^2 - 2(3 \text{ m} \cdot 3 \text{ m}) + 108 \text{ m}^2 = 576 \text{ m}^2$

The surface area of the figure is 576 m².

Additional sample problems with detailed answer steps are found in the *Eureka Math Homework Helpers* books. Learn more at GreatMinds.org.

HOW YOU CAN HELP AT HOME

You can help at home in many ways. Here are some tips to help you get started.

- Draw various shapes with shaded regions, including circular regions, and provide the dimensions of each shape. Ask your child to find the area of each shaded region. For example, you might draw Figure 1 and tell your child that the diameter is 6 cm. Because the shaded region represents a quarter of the circle, your child should use $A = \frac{1}{4}\pi r^2$, where r is the length of the radius (3 cm), to determine the area of the shaded region.

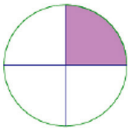


Figure 1

- Gather some boxes of various sizes. Challenge your child to measure the dimensions of each box and calculate its surface area. For an extension, have your child calculate the surface area of a box that has a hole in it, such as a tissue box with a hole where the tissues are pulled out.