

Study Guide and Intervention

7MG2.1, 7MG2.2

Area of Complex Figures

To find the area of a complex figure, separate the figure into shapes whose areas you know how to find. Then find the sum of these areas.

Example Find the area of the complex figure.

The figure can be separated into a semicircle and trapezoid.

Area of semicircle

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

$$A = \frac{1}{2}\pi(7)^2$$

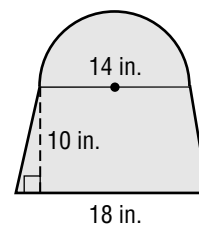
$$A \approx 77.0$$

Area of trapezoid

$$A = \frac{1}{2}h(b_1 + b_2)$$

$$A = \frac{1}{2} \cdot 10 \cdot (14 + 18)$$

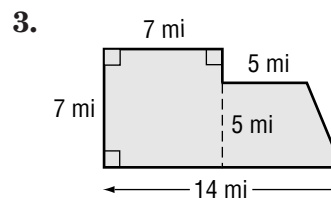
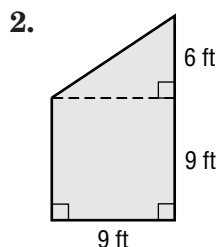
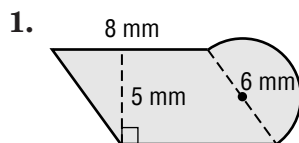
$$A = 160$$



The area of the figure is about $77.0 + 160$ or 237 square inches.

Exercises

Find the area of each figure. Round to the nearest tenth if necessary.



- What is the area of a figure formed using a triangle with a base of 6 meters and a height of 11 meters and a parallelogram with a base of 6 meters and a height of 11 meters?
- What is the area of a figure formed using a semicircle with a diameter of 8 yards and a square with sides of a length of 6 yards?
- What is the area of a figure formed using a rectangle with a length of 9 inches and a width of 3 inches and a triangle with a base of 4 inches and a height of 13 inches?

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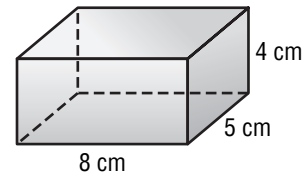
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Volume of Prisms and Cylinders

The volume V of a prism or a cylinder is the area of the base B times the height h , or $V = Bh$.

Example 1 Find the volume of the rectangular prism.

$$\begin{aligned}
 V &= Bh && \text{Volume of a prism} \\
 V &= (\ell \cdot w)h && \text{The base is a rectangle, so } B = \ell \cdot w. \\
 V &= (8 \cdot 5)4 && \ell = 8, w = 5, h = 4 \\
 V &= 160 && \text{Simplify.}
 \end{aligned}$$

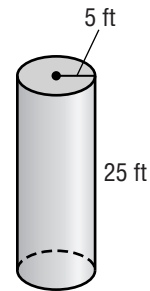


The volume is 160 cubic centimeters.

The volume V of a cylinder with radius r is the area of the base B times the height h , or $V = Bh$. Since the base is a circle, the volume can also be written as $V = \pi r^2 h$, where $B = \pi r^2$.

Example 2 Find the volume of the cylinder. Round to the nearest tenth if necessary.

$$\begin{aligned}
 V &= \pi r^2 h && \text{Volume of a cylinder} \\
 V &= \pi \cdot 5^2 \cdot 25 && r = 5, h = 25 \\
 V &\approx 1,963.5 && \text{Simplify.}
 \end{aligned}$$



The volume is about 1,963.5 cubic feet.

Exercises

Find the volume of each solid. Round to the nearest tenth if necessary.

