

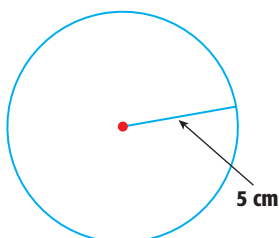
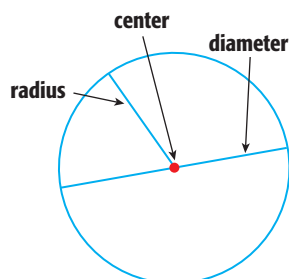
Section Overview



Area and Circumference of Circles

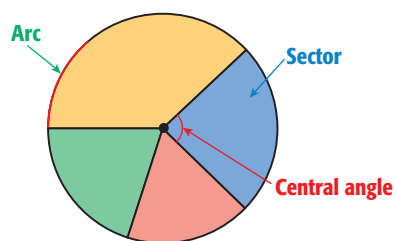
Lesson 9-3

Why? You can find the area and circumference of a circle if you know its radius or diameter.



Circumference	Area
$C = \pi d$, or $2\pi r$	$A = \pi r^2$
$= \pi(10)$	$= \pi(5)^2$
$\approx 3.14(10)$	$\approx 3.14(25)$
≈ 31.4 cm	≈ 78.5 cm ²

Use 3.14 or $\frac{22}{7}$ to approximate π .



A **central angle** of a circle has sides that are radii of the circle.

A **sector** of a circle is enclosed by two radii and the **arc** connecting them.

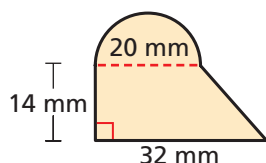
Section Overview



Area of Composite Figures

Lesson 9-5

Why? You can find perimeters and areas of most figures by breaking them down into more basic geometric figures.



$$\begin{aligned}\text{area of semicircle: } \frac{1}{2}\pi r^2 &= \frac{1}{2}\pi(10)^2 \\ &\approx 50(3.14) \\ &= 157 \text{ mm}^2\end{aligned}$$

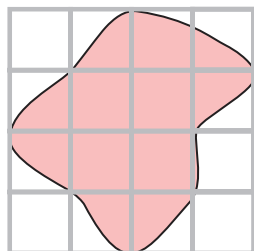
$$\begin{aligned}\text{area of trapezoid: } \frac{1}{2}h(b_1 + b_2) &= \frac{1}{2}(14)(20 + 32) \\ &= \frac{1}{2}(14)(52) \\ &= 364 \text{ mm}^2\end{aligned}$$

The total area of the figure is about $157 + 364 = 521 \text{ mm}^2$.

Area of Irregular Figures

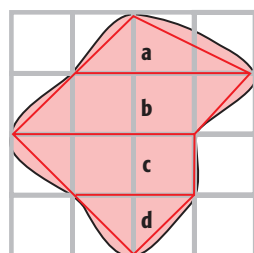
Lesson 9-6

Why? Irregular shapes, such as a lake or an oil spill, are common in everyday life.



In the grid at the left, each square represents 1 square centimeter.

To estimate the area of the figure, draw a composite figure that approximates the irregular shape. Then find the area of each part of the composite figure.



$$\begin{aligned}\text{area of triangle a:} \\ A &= \frac{1}{2}bh = \frac{1}{2}(3)(1) = 1.5 \text{ cm}^2\end{aligned}$$

$$\begin{aligned}\text{area of parallelogram b:} \\ A &= bh = (3)(1) = 3 \text{ cm}^2\end{aligned}$$

$$\begin{aligned}\text{area of trapezoid c:} \\ A &= \frac{1}{2}(1)(3 + 2) = 2.5 \text{ cm}^2\end{aligned}$$

$$\begin{aligned}\text{area of triangle d:} \\ A &= \frac{1}{2}(2)(1) = 1 \text{ cm}^2\end{aligned}$$

The area of the irregular figure is about $1.5 + 3 + 2.5 + 1 = 8 \text{ cm}^2$.