

1-8

Perimeter, Circumference,
and Area

The **perimeter** P of a polygon is the sum of the lengths of its sides. The **area** A of a polygon is the number of square units it encloses. For figures such as squares, rectangles, triangles, and circles, you can use **formulas** for perimeter (or *circumference* C for circles) and area.

Take note

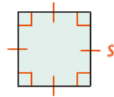
Key Concept Perimeter, Circumference, and Area

Square

side length s

$$P = 4s$$

$$A = s^2$$

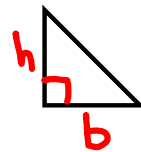
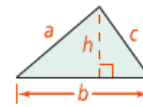


Triangle

side lengths a , b , and c ,
base b , and height h

$$P = a + b + c$$

$$A = \frac{1}{2}bh$$



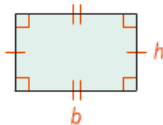
Rectangle

base b and height h

$$P = 2b + 2h, \text{ or}$$

$$2(b + h)$$

$$A = bh$$



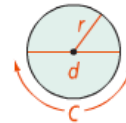
lw

Circle

radius r and diameter d

$$C = \pi d, \text{ or } C = 2\pi r$$

$$A = \pi r^2$$



$$d = 2r$$

The units of measurement for perimeter and circumference include inches, feet, yards, miles, centimeters, and meters. When measuring area, use square units such as square inches (in.^2), square feet (ft^2), square yards (yd^2), square miles (mi^2), square centimeters (cm^2), and square meters (m^2).

1. You want to frame a picture that is 5 in. by 7 in. with a 1-in.-wide frame.
 - a. What is the perimeter of the picture?
 - b. What is the perimeter of the outside edge of the frame?

$$a. P = 2l + 2w$$

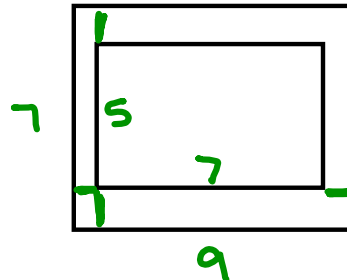
$$P = 2(5) + 2(7)$$

$$P = 24 \text{ in}$$

$$b. P = 2l + 2w$$

$$P = 2(7) + 2(9)$$

$$P = 32 \text{ in}$$

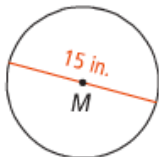


You can name a circle with the symbol \odot . For example, the circle with center A is written $\odot A$.

Problem 2 Finding Circumference

What is the circumference of the circle in terms of π ? What is the circumference of the circle to the nearest tenth?

A $\odot M$

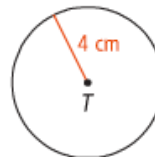


$$C = \pi d$$

$$15\pi \text{ in}$$

$$47.1 \text{ in}$$

B $\odot T$



$$C = 2\pi r$$

$$2\pi(4)$$

$$8\pi \text{ cm}$$

$$25.1 \text{ cm}$$


Problem 3 Finding Perimeter in the Coordinate Plane

 Coordinate Geometry What is the perimeter of $\triangle EFG$?

$$d = \sqrt{(3 - (-3))^2 + (6 - (-2))^2}$$

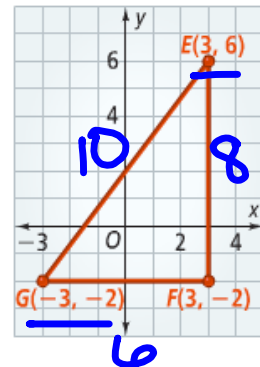
$$\sqrt{6^2 + 8^2}$$

$$\sqrt{36 + 64}$$

$$\sqrt{100}$$

$$10$$

$$P = 6 + 8 + 10 = 24$$



4. You are designing a poster that will be 3 yd wide and 8 ft high. How much paper do you need to make the poster? Give your answer in square feet.

$$A = lw$$

$$A = 9(8)$$

$$A = 72 \text{ ft}^2$$

$$\frac{8 \text{ ft}}{1} \cdot \frac{3 \text{ yd}}{1 \text{ yd}} = \frac{9 \text{ ft}}{1}$$

5. The diameter of a circle is 14 ft.

a. What is the area of the circle in terms of π ?

~~b. What is the area of the circle using an approximation of π ?~~

$$A = \pi r^2$$

$$A = \pi (7)^2$$

$$A = 49\pi \text{ ft}^2$$

$$d = \frac{14}{2}$$

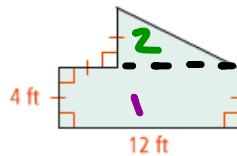
$$r = 7$$

Take note

Postulate 1-10 Area Addition Postulate

The area of a region is the sum of the areas of its nonoverlapping parts.

b. What is the area of the figure at the right?



$$A = 4(12)$$

$$A = 48 \text{ ft}^2$$

$$A = \frac{1}{2}(8)(4)$$

$$A = 16 \text{ ft}^2$$

$$48 + 16 = 64 \text{ ft}^2$$

Name

1.8

pg. 64-66 # 7-9

10-30 even

31-37

41-46

60-63