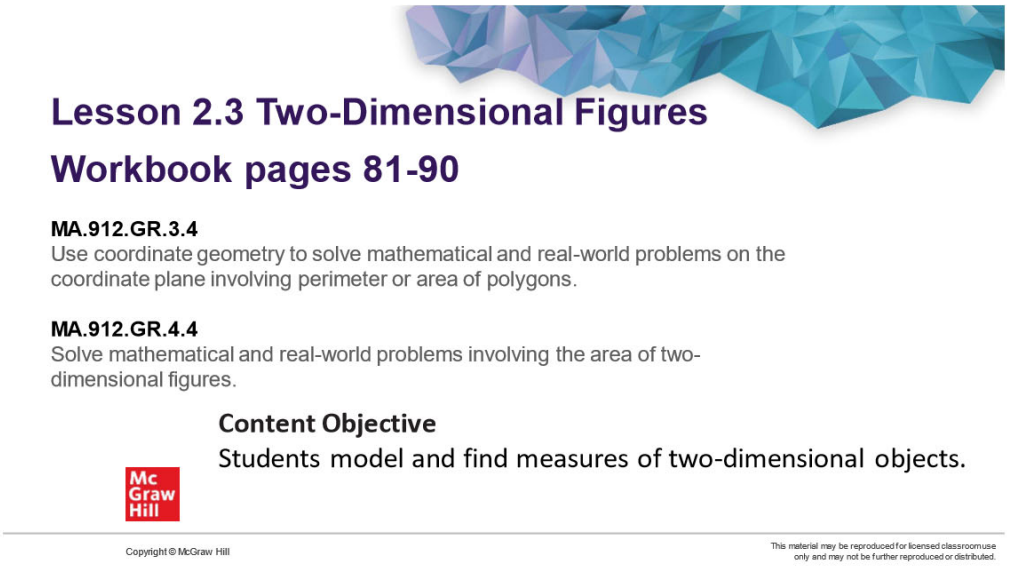
Lesson 2.3 Two-Dimensional Figures

Tuesday, September 26, 2023 7:54 PM

Click Link Below to Open the Interactive Pear Deck PowerPoint

https://app.peardeck.com/student/tccldxbit

Lesson 2.3
Two



Learn

Perimeter, Circumference, and Area

A **polygon** is a closed plane figure with at least three straight sides.

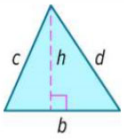
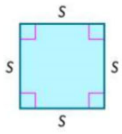
The **perimeter** of a polygon is the sum of the lengths of the sides of the polygon. Some shapes have special formulas for perimeter, but all are derived from the basic definition of perimeter.

The **circumference** of a circle is the distance around the circle.

Area is the number of square units needed to cover a surface.

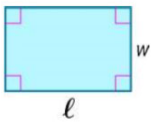
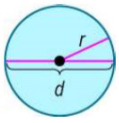
Learn

Perimeter, Circumference, and Area

Perimeter, Circumference, and Area	
Triangle	**Square**
	
Perimeter $P = b + c + d$ Area $A = \frac{1}{2}bh$	Perimeter $P = s + s + s + s = 4s$ Area $A = s^2$

Learn

Perimeter, Circumference, and Area

Perimeter, Circumference, and Area	
Rectangle	**Circle**
	
Perimeter $P = \ell + w + \ell + w = 2\ell + 2w$ Area $A = \ell w$	Circumference $C = 2\pi r$ or $C = \pi d$ Area $A = \pi r^2$

Learn

Perimeter, Circumference, and Area

You can use the Distance Formula to find the perimeter and area of a polygon graphed on a coordinate plane. You can also use the Distance Formula to calculate the radius of a circle and then use the appropriate equations for circumference and area.

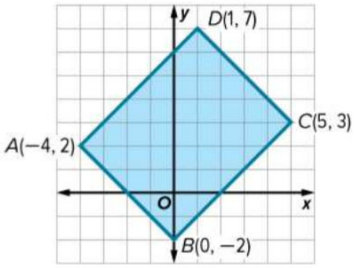
An **equilateral polygon** has all sides congruent. An **equiangular polygon** has all angles congruent. A **regular polygon** is a convex polygon that is both equilateral and equiangular.

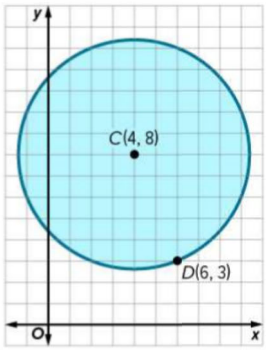
Example 1
Find Perimeter, Circumference, and Area

Find the perimeter or circumference and area of each figure.

a. Rectangle *ABCD*

b. Circle *C*

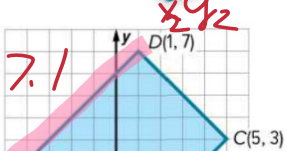




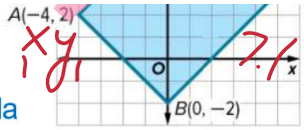
Example 1
Find Perimeter, Circumference, and Area

a. Rectangle *ABCD*

First, find the length ℓ of the rectangle by



using the Distance Formula. Let the length be equal to *AD*.



$\ell = \sqrt{(x_2 - x_1)^2 + (y_2 - y_1)^2}$ Distance Formula

$(1+4)^2 + (7-2)^2$

$(5)^2 + (5)^2$

$25 + 25$

$\sqrt{50} = 7.1$

$\sqrt{50}$

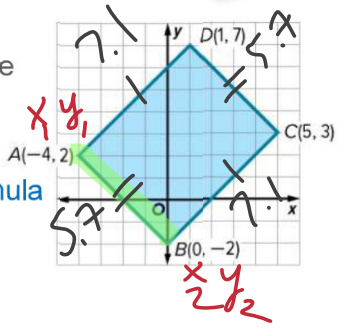
$\sqrt{25}\sqrt{2}$

$5\sqrt{2}$

Example 1

Find Perimeter, Circumference, and Area

Next, find the width *w* of the rectangle by using the Distance Formula. Let the width be equal to *AB*.



$w = \sqrt{(x_2 - x_1)^2 + (y_2 - y_1)^2}$ Distance Formula

$(0+4)^2 + (-2-2)^2$

$(4)^2 + (-4)^2$

$16 + 16$

$\sqrt{32} = 5.7$

$\sqrt{32}$

$\sqrt{16}\sqrt{2}$

$4\sqrt{2}$

Example 1
Find Perimeter, Circumference, and Area

Use the length and width that you calculated to find the perimeter and area of the rectangle.

Perimeter of a rectangle

$7.1 + 7.1 + 5.7 + 5.7$

25.6

Area of a rectangle

$A = lw$

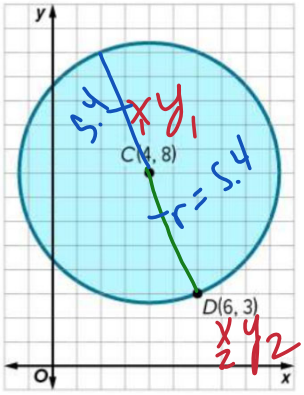
$A = (7.1)(5.7)$

$A = 40.5$

Example 1
Find Perimeter, Circumference, and Area

b. Circle *C*

Use the Distance Formula to calculate the length of the radius of the circle.



diameter 10.8

$r = \sqrt{(x_2 - x_1)^2 + (y_2 - y_1)^2}$ Distance Formula

$(6-4)^2 + (3-8)^2$

$(2)^2 + (-5)^2$

$4 + 25$

$\sqrt{29} = 5.4$

Example 1
Find Perimeter, Circumference, and Area

Use the value of *r* to find the circumference and area of the circle.

$C = 2\pi r$ Circumference

$C = 2(\pi)(5.4)$

$C = 33.9$

$C = \pi d$

$C = 10.8\pi = 33.9$

$A = \pi r^2$

Area of a circle

$A = \pi(5.4)$

$A = 29.2(\pi)$

$A = 91.6$

Example 1

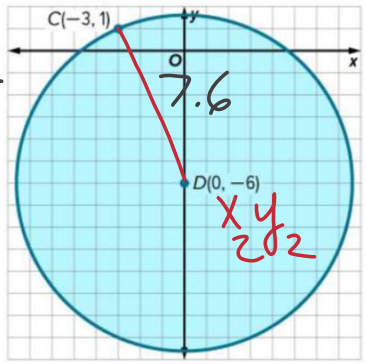
Find Perimeter, Circumference, and Area

Check

$\sqrt{(x_2-x_1)^2+(y_2-y_1)^2}$

$x y_1$

Find the circumference and area of the circle. Round to the nearest tenth, if necessary.



$(0+3)^2+(-6-1)^2$

$(3)^2+(-7)^2$

$9+49$

$\sqrt{58} = 7.6$

$x y_2 2 2$

$A = \pi r^2$

$\pi(7.6)^2$

181.5

$C = 2\pi r$

$2(\pi)(7.6)$

47.8

πd

$\pi(15.2)$

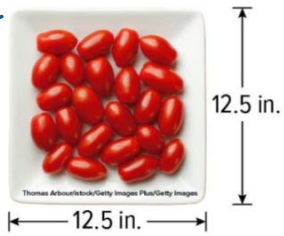
Example 2
Modeling with Two-Dimensional Figures

TABLEWARE Use an appropriate two-dimensional model and the dimensions provided in the image to calculate the perimeter and area of the serving platter.

$12.5(4) = 50$ in

12.5

12.5



$A = lw$

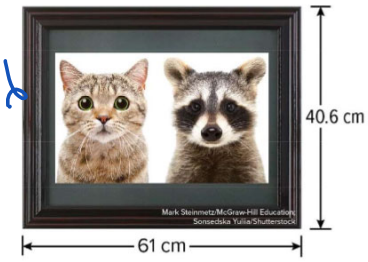
$(12.5)(12.5)$

156.2

Example 2
Modeling with Two-Dimensional Figures

Check

FRAMES Use an appropriate two-dimensional model and the dimensions provided in the image to calculate the perimeter and area of the framed art.



40.6 + 61 + 40.6 + 61 =

203.2

61

40.6

A = lw

(40.6)(61)

2476.6