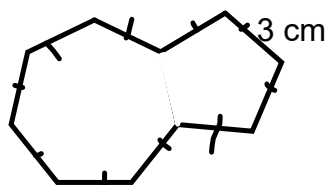




Chapter 6  
Geometry & Measurement

Lesson 5

- a) Find the perimeter of the polygon with **all** equal sides.  
Write a rule to find the perimeter (Show work)



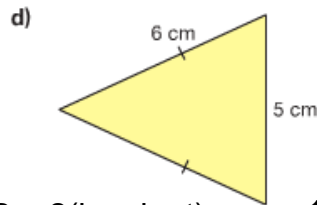
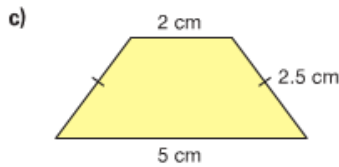
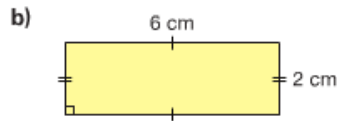
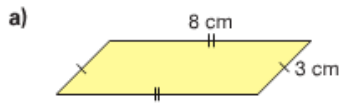
$$\begin{aligned} P &= 10 \times \text{side} \\ &= 10 \times 3 \text{ cm} \\ &= 30 \text{ cm} \end{aligned}$$

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**Practice**



1. Find the perimeter of each polygon.



1a)  $P = 2(l + \text{slant})$   
 $= 2(8\text{cm} + 3\text{cm})$   
 $= 2(11\text{ cm})$   
 $= 22\text{ cm}$

1b)  $P = 2(l + \text{slant})$   
 $= 2(6\text{cm} + 2\text{cm})$   
 $= 2(8\text{ cm})$   
 $= 16\text{ cm}$

1c)  $P = 2\text{ slant} + \text{top} + \text{bottom}$   
 $= 2(2.5\text{ cm}) + 2\text{cm} + 5\text{ cm}$   
 $= 5\text{ cm} + 2\text{cm} + 5\text{ cm}$   
 $= 12\text{ cm}$

1d)  $P = \text{side} + \text{side} + \text{side}$   
 $= 6\text{ cm} + 6\text{ cm} + 5\text{ cm}$   
 $= 17\text{ cm}$

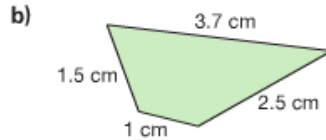
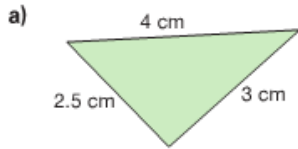
2. Describe the strategy you used to find the perimeter of each polygon in question 1.

(See the first line in each perimeter statement)



3. Find the perimeter of each polygon.

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Can you write a rule to find the perimeter of each of these polygons? Why or why not? **Cannot since no sides are equal**

3a)  $P = \text{side} + \text{side} + \text{side}$

$$= 4 \text{ cm} + 3 \text{ cm} + 2.5 \text{ cm}$$

$$= 9.5 \text{ cm}$$

3b)  $P = \text{side} + \text{side} + \text{side} + \text{side}$

$$= 1.5 \text{ cm} + 3.7 \text{ cm} + 2.5 \text{ cm} + 1 \text{ cm}$$

$$= 8.7 \text{ cm}$$

4. Use Pattern Blocks like those below.



Write a rule to find the perimeter of each Pattern Block.

perimeter of Equilateral triangle = 3 (side)

perimeter of rhombus =  $2(s + l)$

perimeter of Trapezoid =  $2(\text{side}) + \text{top} + \text{bottom}$

perimeter of Regular Hexagon = 6 (side)

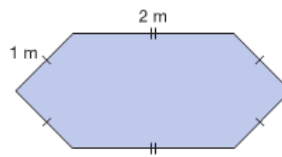
- ★ 5. Aldo wants to install a skylight in the roof of his house. The base of the skylight is a regular hexagon with side length 40 cm. What is the perimeter of the base of the skylight? Give your answer in metres. Which strategy did you use to find out?



regular hexagon has 6 equal sides

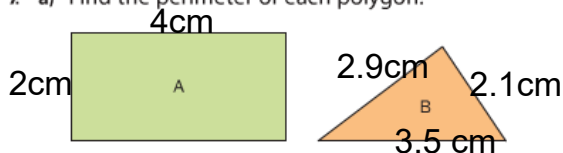
$$\begin{aligned} P \text{ of regular hexagons} &= 6 (\text{side}) \\ &= 6 (40 \text{ cm}) \\ &= 240 \text{ cm} \quad \text{since } 100\text{cm} = 1 \text{ m} \\ &= 2.4 \text{ m} \end{aligned}$$

6. Winnie is building a hexagonal storage box. Here is a drawing of the top of the box.
- Write a rule to find the perimeter of the top of the box.
  - Write the rule as a formula.
  - What is the perimeter of the top of the box?



$$\begin{aligned} \text{Per} &= 4(\text{slant}) + 2(\text{top}) \\ \text{a) Per} &= 4(1\text{m}) + 2(2\text{m}) \\ &= 4 \text{ m} + 4 \text{ m} \\ &= 8 \text{ m} \end{aligned}$$

7. a) Find the perimeter of each polygon.



- b) Suppose the side lengths of each polygon are doubled. What would happen to each perimeter? Explain.

$$\begin{aligned} \text{7a) Per Rec} &= 2(l + w) & \text{Per tri} &= \text{side} + \text{side} + \text{side} \\ &= 2(4\text{cm} + 2\text{cm}) & &= 2.9 \text{ cm} + 2.1 \text{ cm} + 3.5 \text{ cm} \\ &= 2(6 \text{ cm}) & &= 8.5 \text{ cm} \\ &= 12 \text{ cm} \end{aligned}$$

- 7b) If the side lengths double the perimeter would double

$$\begin{aligned} \text{Doubled} & & \text{Per tri} &= \text{side} + \text{side} + \text{side} \\ \text{Per Rec} &= 2(l + w) & &= 5.8 \text{ cm} + 4.2 \text{ cm} + 7 \text{ cm} \\ &= 2(8\text{cm} + 4\text{cm}) & &= 17 \text{ cm} \\ &= 2(12 \text{ cm}) \\ &= 24 \text{ cm} \end{aligned}$$



8. Your teacher will give you a large copy of these regular polygons.

**TIP**  $p = 6 \times s$   
 $= 6 \times 0.9 \text{ cm}$   
 $= 5.4 \text{ cm}$

**A** (Hexagon): side length 0.9 cm  
 $p = 6 \times s$   
 $= 6 \times 0.9 \text{ cm}$   
 $= 5.4 \text{ cm}$

**C** (Triangle): side length 1.7 cm  
 $p = 3 \times s$   
 $= 3 \times 1.7 \text{ cm}$   
 $= 5.1 \text{ cm}$

**E** (Hexagon): side length 1.4 cm  
 $p = 6 \times s$   
 $= 6 \times 1.4 \text{ cm}$   
 $= 8.4 \text{ cm}$

**G** (Triangle): side length 2.1 cm  
 $p = 3 \times s$   
 $= 3 \times 2.1 \text{ cm}$   
 $= 6.3 \text{ cm}$

**B** (Pentagon): side length 1.8 cm  
 $p = 5 \times s$   
 $= 5 \times 1.8 \text{ cm}$   
 $= 9 \text{ cm}$

**D** (Square): side length 0.9 cm  
 $p = 4 \times s$   
 $= 4 \times 0.9 \text{ cm}$   
 $= 3.6 \text{ cm}$

**F** (Hexagon): side length 0.8 cm  
 $p = 6 \times s$   
 $= 6 \times 0.8 \text{ cm}$   
 $= 4.8 \text{ cm}$

**H** (Square): side length 2.1 cm  
 $p = 4 \times s$   
 $= 4 \times 2.1 \text{ cm}$   
 $= 8.4 \text{ cm}$

- a) Find and record the perimeter of each polygon.  
 b) How is the perimeter of a regular polygon related to the number of its sides?  
 Write a formula to find the perimeter of a regular polygon.
- The perimeter is number of sides multiplied by the side length.

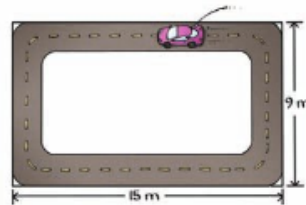
$$P \text{ of regular polygon} = \# \text{ sides} \times \text{side length}$$



9. Saki has a remote control car. She enters her car in a race.

The track is close to rectangular.

- a) Use a formula to find the perimeter of the track.  
 b) Suppose the car completes 8 laps.  
 How far did the car travel?



$$9) \text{Per Rec} = 2(l + w)$$

$$= 2(15 \text{ m} + 9 \text{ cm})$$

$$= 2(24 \text{ m})$$

$$= 48 \text{ m}$$

b) 1 lap is 48 m so

$$8 \text{ laps} = 48 \text{ m} \times 8$$

$$= 384 \text{ m}$$

The car travel  
 384 m in  
 8 laps

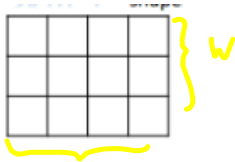
### Area of Rectangle

- Area is the total space a shape takes up

- measured in squared units

$\text{mm}^2$ ,  $\text{cm}^2$ ,  $\text{m}^2$ ,  $\text{km}^2$

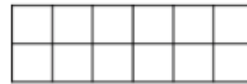
Can you find the area of each rectangle



$$\text{Area} = \underline{12} \text{ units}^2$$

$$\longleftrightarrow \text{length} = \underline{4} \text{ units}$$

$$\updownarrow \text{Width} = \underline{3} \text{ units}$$



$$\text{Area} = \underline{12} \text{ units}^2$$

$$\longleftrightarrow \text{length} = \underline{6}$$

$$\updownarrow \text{Width} = \underline{2}$$

How could you use Length and width to find area?

Length can also be call base

Width can also be called height

$$A = L \times W$$

$\leftrightarrow$     $\downarrow$

$$A = b \times h$$

$\leftrightarrow$     $\downarrow$



$$\text{Area of Rectangle} = \text{Length} \times \text{Width}$$



You always write out the formula then sub values in.

\*It does not matter which measurement you use as the length or the width\*

Find the area of a rectangle with dimensions 12 cm by 10 cm

$$\begin{aligned} A &= L \times W \\ &= 12\text{cm} \times 10\text{cm} \\ &= 120\text{cm}^2 \end{aligned}$$

Given the following determine the missing amount?



- 1) Area of rectangle is 36 cm<sup>2</sup>. Find the width of the rectangle if the length is 4 cm? (Show work)

$$A = L \times w$$

$$36\text{cm}^2 = 4\text{cm} \times \frac{w}{\downarrow 9\text{cm}}$$

The width is 9cm  
Given Area

$$W = A \div L$$

$$L = A \div W$$

- 2) Area of rectangle is 78.4 cm<sup>2</sup>. Find the length of the rectangle if the width is 7 cm? (Show work)

$$L = A \div W$$

$$= 78.4\text{cm}^2 \div 7\text{cm}$$

$$L = 11.2\text{cm}$$



So we can rearrange

$$A = L \times W$$

to find length or width



$$\text{Length} = \text{Area} \div \text{width}$$

$$\text{Width} = \text{Area} \div \text{length}$$

This is good to use when we struggle to do math in our head

3) Area of rectangle is  $26.64 \text{ cm}^2$ . Find the width of the rectangle if the length is  $7.4 \text{ cm}$ ? (Show work)

$$\begin{aligned} W &= A \div L \\ &= 26.64 \text{ cm}^2 \div 7.4 \text{ cm} \\ &= 3.6 \text{ cm} \end{aligned}$$

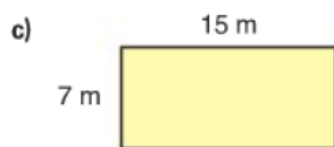
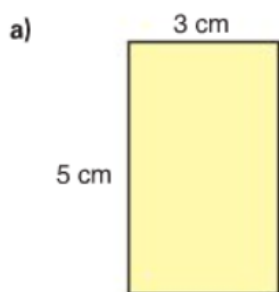
# Class/Homework

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#1, #3, #4, #6, #8

**Practice**

★ 1. Find the area of each rectangle.

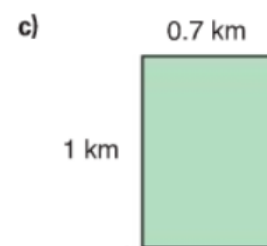
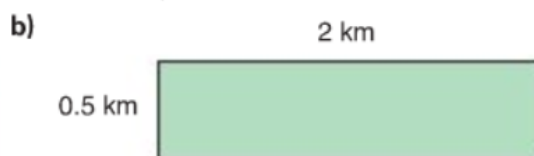
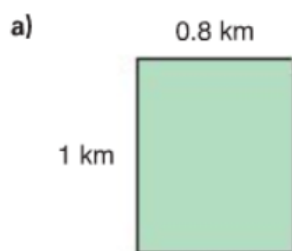


2. Which rectangle below do you think has the greatest area?

Estimate first. Use a formula to check.

Order the areas from least to greatest.

How does the order compare with your prediction?



★ 3. Copy and complete this chart.

Rectangle	Length (cm)	Width (cm)	Area (cm <sup>2</sup> )
A	7	5	?
B	?	6	12.6
C	3	?	13.5
D	5.3	7	?

Which strategy did you use to find the missing number each time?

- ★ 4. Matt's dog has a rectangular dog run.  
The length of the dog run is 8 m. The total area enclosed is  $56 \text{ m}^2$ .  
How wide is the dog run? Draw a diagram.  
How can you use a number sentence to show your thinking?



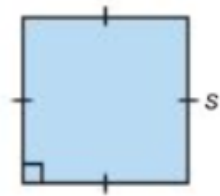
5. Lena used 36 m of fencing to enclose a rectangular vegetable garden on her farm in Battleford, Saskatchewan.
- Sketch some possible rectangles and label their side lengths.  
What is the area of the enclosed section in each case?
  - How many different answers can you find?

- ★ 6. A banner for the Vancouver 2010 Olympics has length 226 cm and width 72 cm. What is the area of the banner?



7. Hailey bought a can of stain. The stain will cover  $50 \text{ m}^2$  of fencing. The fence has height 2 m. What length of fencing can Hailey stain before she runs out of stain? How did you find out?

- ★8. A square has side length  $s$ .



Write a formula for the area of a square.

9. The Festival du Voyageur is a winter festival that takes place in St. Boniface, Manitoba, each February. The festival's logo contains a red rectangle. Suppose the logo is enlarged so the rectangle has width 4 cm and area  $28.8 \text{ cm}^2$ . What is the length of the rectangle? How did you find out?



10. Rectangle A has area  $40 \text{ cm}^2$  and length 8 cm.

The area of Rectangle B is one-half the area of Rectangle A.

The rectangles have the same length.

What is the width of Rectangle B?