

MAP4C1 Unit 2: Geometry

2.1 Conversions, Perimeter and Area

Learning Goals: I am learning to...

- Convert units of measurement between the metric and imperial system and vice versa.
- Determine the perimeter and area of simple 2D figures and apply this to real world application problems.



Recall Key Terms:

Conversion Factors	used to change imperial units to metric and vice versa
Perimeter	The distance around the outside of the shape (add all sides)
Area	The number of square units needed to cover a shape (space it takes up)
Volume	The amount of space occupied by an object (cubed units)
Surface Area	The are of all surfaces in an object (square units)

Part A: Conversions

Example 1: Convert each unit of measure. Round to 2 decimal places.

a) $5\frac{1}{4}$ inches \rightarrow centimetres (cm)
 $1 \text{ inch} = 2.54 \text{ cm}$

$$5.25 \cancel{\text{in}} \times \frac{2.54 \text{ cm}}{1 \cancel{\text{in}}} = 13.34 \text{ cm}$$

c) 8.0 gallons \rightarrow Litres (L)
 $1 \text{ gallon} = 4.546 \text{ L}$

$$8.0 \cancel{\text{gallons}} \times \frac{4.546 \text{ L}}{1 \cancel{\text{gallons}}} = 36.37 \text{ L}$$

b) $7.3 \text{ km}^2 \rightarrow$ square miles (miles²)

$$1 \text{ km} = 0.6214 \text{ miles}$$

$$1 \text{ km}^2 = (0.6214)^2 \text{ miles}^2$$

$$7.3 \text{ km}^2 \times \frac{0.6214^2 \text{ miles}^2}{1 \text{ km}^2} = 2.82 \text{ miles}^2$$

d) 170 mL \rightarrow fluid ounces (fl. Oz.)

$$1 \text{ mL} = 0.0352 \text{ fl. oz.}$$

$$170 \text{ mL} \times \frac{0.0352 \text{ fl. oz.}}{1 \text{ mL}} = 5.98 \text{ fl. oz.}$$

e) In 2005, Canadians consumed on average 94.7 L of milk per person. Americans consumed on average 21.2 US galls per person. Each US gallon is equivalent to 3.785 L. Which country had the greater milk consumption per person? Justify your answer.

$$1 \text{ US gallon} = 3.785 \text{ L}$$

$$21.2 \cancel{\text{US gallons}} \times \frac{3.785 \text{ L}}{1 \cancel{\text{US gallon}}} = 80.24 \text{ L}$$

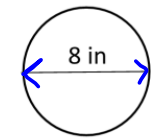
\therefore Canadians consumed more milk per person

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Part B: Perimeter and Area

Example 2: Determine the measure indicated for each geometric figure/object

a) Circumference (perimeter)



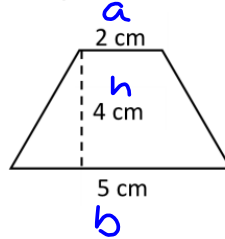
$d = 8 \text{ in}$

$$C = \pi d \quad C = 2\pi r$$

$$C = \pi(8)$$

$$= 25.1 \text{ in}$$

b) Find area



$$A = \frac{(a+b)h}{2}$$

$$= \frac{(2+5)(4)}{2}$$

$$= \frac{28}{2}$$

$$= 14 \text{ cm}^2$$

c) Determine the diameter of a circle with an area of 36 m^2 .

$A = 36 \text{ m}^2$

$d = ?$

① $A = \pi r^2$

$$\frac{36}{\pi} = \frac{\pi r^2}{\pi}$$

$$\frac{36}{\pi} = r^2$$

$$\sqrt{\frac{36}{\pi}} = r$$

$$3.4 \text{ m} = r$$

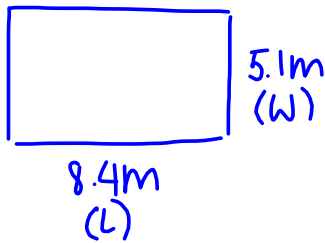
② $d = 2r$

$$= 2(3.4)$$

$$= 6.8 \text{ m}$$

\therefore The diameter is 6.8 m

d) Find the cost of installing tiles on a floor that is 8.4 m long and 5.1 m wide if the tiles cost $\$34.95/\text{m}^2$.



① Area

$$A = LW$$

$$= 8.4(5.1)$$

$$= 42.84 \text{ m}^2$$

② Total price

$$42.84(34.95)$$

$$= 1497.26$$

\therefore The total price is $\$1497.26$