



# GEOMETRY

SCALE

Racquel drew a picture of her school. She used the scale  $1\text{cm}:3\text{m}$ . Her drawing is  $61\text{cm}$  long. What is the length, in meters, of the actual school?



Solve as a proportion

Step 1:

Write the scale as a fraction

$$1 \text{ cm} : 3 \text{ m} = \frac{1 \text{ cm}}{3 \text{ m}}$$

Step 2:

Create a proportion with similar units in the same position

$$\frac{1 \text{ cm}}{3 \text{ m}} = \frac{61 \text{ cm}}{x \text{ m}}$$

Drop the units and solve

$$1 \text{ cm} = 3 \text{ m}$$

$$\frac{1 \text{ cm}}{3 \text{ m}} = \frac{61 \text{ cm}}{x \text{ m}}$$

$$\frac{1}{3} = \frac{61}{x}$$

$$x = (3 \cdot 61)$$

$$x = 183$$

The actual length of the school is 183 m

## NOW TRY THIS

Lisa drew the picture of a boat. She used the scale  $1 \text{ inch} = 8 \text{ ft}$ . Her picture is 7.25 inches long. What is the length, in feet, of the actual boat?

$$\frac{1 \text{ inch}}{8 \text{ ft}} = \frac{7.25 \text{ inches}}{x \text{ ft}}$$

$$\frac{1}{8} = \frac{7.25}{x}$$

$$x = (8 \cdot 7.25)$$

$$x = 58$$

The actual length of the boat is 58 feet

## DAY 2

A fence is shown on a blueprint and has sides of 17 cm, 15 cm, 18 cm, and 19 cm. If the scale on the blueprint is 2 cm: 5 m, what is the total length of the fence?

# Solution

$$2 \text{ cm} = 5 \text{ m}$$

$$\frac{2 \text{ cm}}{5 \text{ m}} = \frac{17 \text{ cm}}{x \text{ m}}$$

$$\frac{2 \text{ cm}}{5 \text{ m}} = \frac{15 \text{ cm}}{x \text{ m}}$$

$$\frac{2 \text{ cm}}{5 \text{ m}} = \frac{18 \text{ cm}}{x \text{ m}}$$

$$\frac{2 \text{ cm}}{5 \text{ m}} = \frac{19 \text{ cm}}{x \text{ m}}$$

$$2x = (5 \cdot 17)$$

$$2x = (5 \cdot 15)$$

$$2x = (5 \cdot 18)$$

$$2x = (5 \cdot 19)$$

$$2x = 85$$

$$2x = 75$$

$$2x = 90$$

$$2x = 95$$

$$\frac{2x}{2} = \frac{85}{2}$$

$$\frac{2x}{2} = \frac{75}{2}$$

$$\frac{2x}{2} = \frac{90}{2}$$

$$\frac{2x}{2} = \frac{95}{2}$$

$$x = 42.5$$

$$x = 37.5$$

$$x = 45$$

$$x = 47.5$$

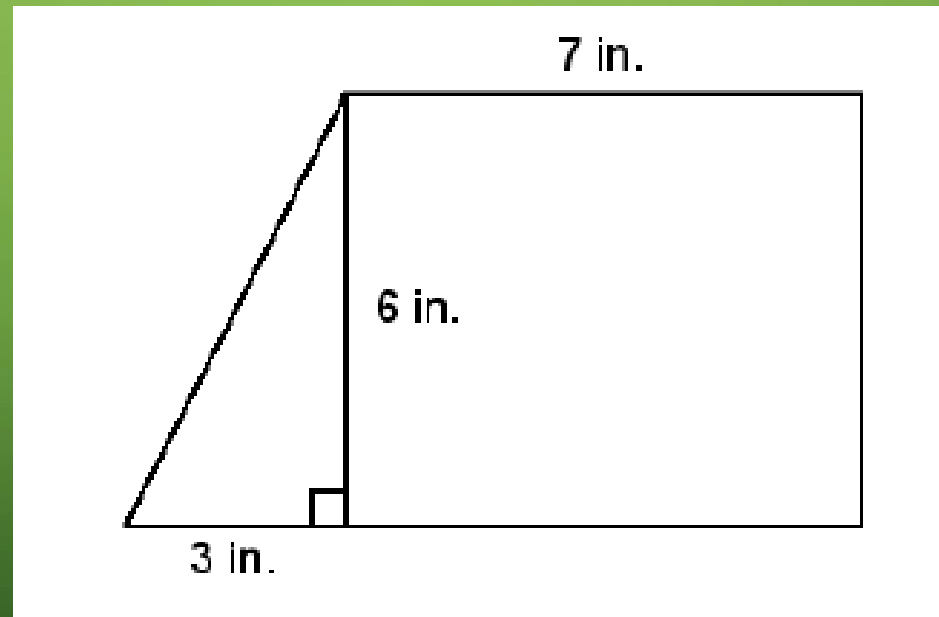
$$\text{Total length} = (42.5 + 37.5 + 45 + 47.5) \text{ m} = 172.5$$

**The total length of the fence is 172.5 m**

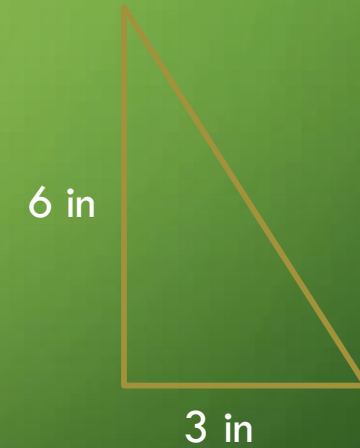
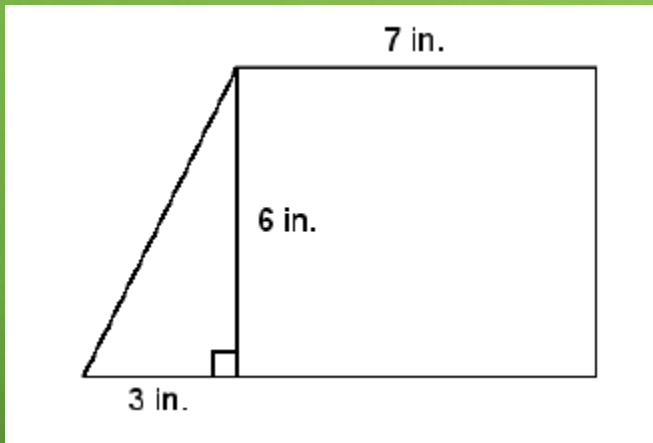


## DAY 3

- Find the area of the figure below



Divide the figure into two known shapes



Find the area of each shape and add the areas.



$$\begin{aligned}\text{Area} &= bh \\ &= (7 \cdot 6) \text{ sq. in} \\ &= 42 \text{ sq. in}\end{aligned}$$



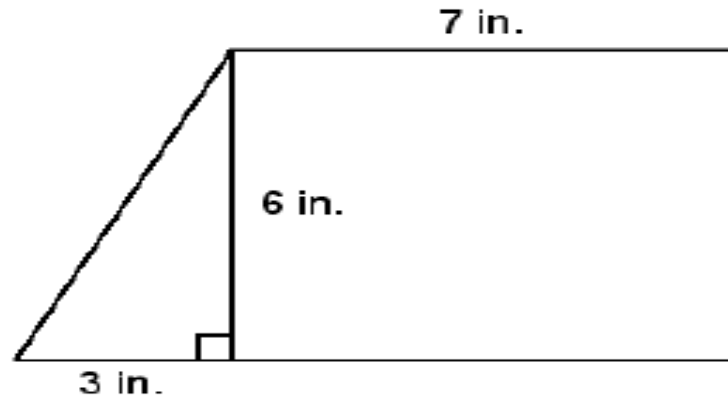
$$\begin{aligned}\text{Area} &= \frac{1}{2}bh \\ &= \left(\frac{1}{2} \cdot 3 \cdot 6\right) \text{ sq. in} \\ &= 9 \text{ sq. in}\end{aligned}$$

$$\text{Area} = (42 + 9) \text{ sq. in} = 51 \text{ sq. in}$$

Area of the figure is 51 sq. in

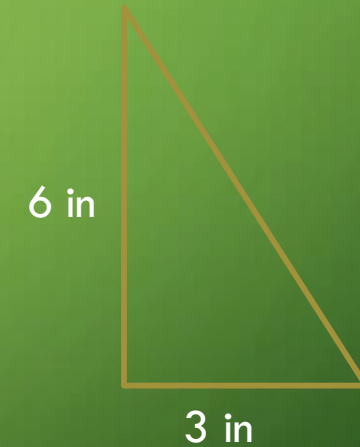
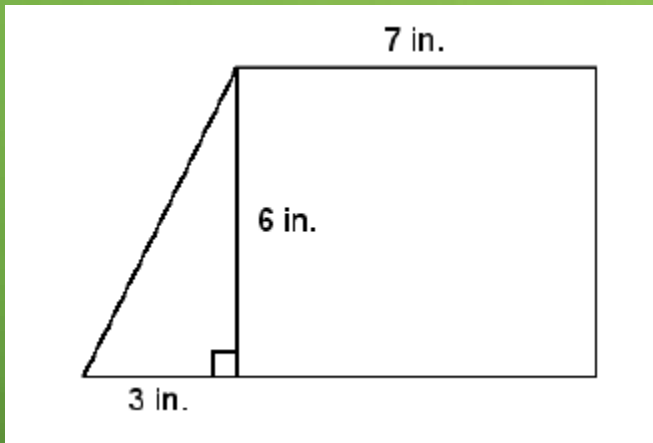
# DAY 4

- The scale drawing has a scale of 1 inch:9 yards. What is the total area of the composite figure?



- A) 51 square inches
- B) 459 square yards
- C) 4,131 square yards
- D) 4,860 square yards

Divide the figure into two known shapes



Next find the actual measurement of each shape.  
Then find the area of each figure.  
Finally add the areas.

$$1 \text{ in} = 9 \text{ yd}$$

$$7 \text{ in} = 63 \text{ yd}$$

$$6 \text{ in} = 54 \text{ yd}$$

$$\begin{aligned} \text{Area} &= bh \\ &= (63 \cdot 54) \text{ sq. yd} \\ &= 3402 \text{ sq. yd} \end{aligned}$$

$$6 \text{ in} = 54 \text{ yd}$$

$$\begin{aligned} \text{Area} &= \frac{1}{2}bh \\ &= \frac{1}{2}(54 \cdot 27) \text{ sq. yd} \\ &= 729 \text{ sq. yd} \end{aligned}$$

$$3 \text{ in} = 27 \text{ yd}$$

Area of figure in square yards is  $(3402 + 729)$  5131 square yards.

NB: Remember you could not find the area in inches and multiply by 9. Area is two dimensional.

If you found the area in inches, instead of multiplying by 9, you would have to multiply by  $(9 \cdot 9, 81$

That is,  $51 \text{ sq in} \cdot 81 = 4131 \text{ sq. inches}$