

## Notes 6-1: Area and Perimeter

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

Area is measured in units squared.

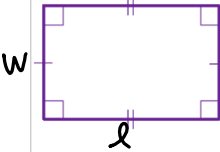
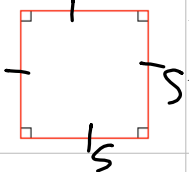
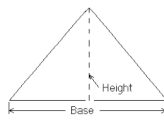
$$A^2$$

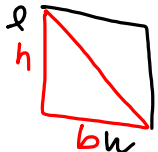
Perimeter is the distance around a figure.

Perimeter is measured in given units.

2' → feet

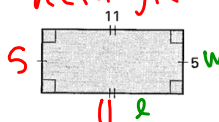
6" → inches

Shape	Area	Perimeter
	Area of rectangle = Length x Width $A = lw$	Perimeter of rectangle = 2length + 2width $P = 2l + 2w$
	Area of square = side x side $A = s^2$	Perimeter of square = 4 x side $S + S + S + S$ $P = 4s$
	Area of triangle = $\frac{1}{2}$ x Base x Height $A = \frac{1}{2}bh$	Perimeter of triangle = $A = \frac{b \cdot h}{2}$ $P = a + b + c$



Ex. 1 Find the area and perimeter of the figure.

a. **rectangle**



PERIMETER

$$P = 2l + 2w$$

$$P = 2 \cdot 11 + 2 \cdot 5$$

$$P = 22 + 10$$

$$P = 32$$

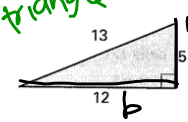
AREA

$$A = l \cdot w$$

$$A = 11 \cdot 5$$

$$A = 55$$

b. **triangle**



PERIMETER

$$P = a + b + c$$

$$P = 12 + 5 + 13$$

$$P = 17 + 13$$

$$P = 30$$

AREA

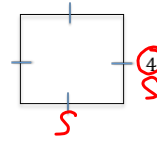
$$A = \frac{b \cdot h}{2}$$

$$A = \frac{12 \cdot 5}{2}$$

$$A = \frac{60}{2}$$

$$A = 30$$

c. **square**



PERIMETER

$$P = 4s$$

$$P = 4 \cdot 4$$

$$P = 16$$

AREA

$$A = s^2$$

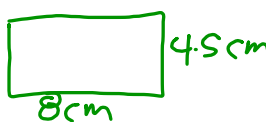
$$A = 4^2$$

$$A = 4 \cdot 4$$

$$A = 16$$

Ex. 3 Find the area and perimeter of the figure.

a. **Rectangle with length 8 centimeters and width 4.5 centimeters.**



PERIMETER

$$P = 2l + 2w$$

$$P = 2 \cdot 8 + 2 \cdot 4.5$$

$$P = 16 \text{ cm} + 9 \text{ cm}$$

$$P = 25 \text{ cm}$$

AREA

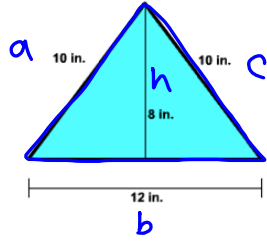
$$A = l \cdot w$$

$$A = 8 \cdot 4.5$$

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

b.

a. **triangle**



PERIMETER

$$P = a + b + c$$

$$P = 10 + 10 + 12$$

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

AREA

$$A = \frac{b \cdot h}{2}$$

$$A = \frac{12 \cdot 8}{2}$$

$$A = \frac{96}{2}$$

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

Sometimes we have to find the area or perimeter of irregular shapes.

In order to find the area or perimeter of irregular shapes, you need to break up the figure into shapes we do know how find, then add them all together.

Ex. 4 Find the area of the following figures.

Perimeter:  $P: 9 + 4 + 7 + 6 + 2 + 10 = 38 \text{ cm}$

Area of rectangle:  $A: l \cdot w$   
 $A: 4 \cdot 9$   
 $A: 36 \text{ cm}^2$

Area of trapezoid:  $A: l \cdot w$   
 $A: 6 \cdot 2$   
 $A: 12 \text{ cm}^2$

Total Area:  $36 \text{ cm}^2 + 12 \text{ cm}^2$   
 $A: 48 \text{ cm}^2$

Ex. 4 Find the area of the following figures.

Perimeter:  $P = 5 + 7 + 4 + 5 + 5 = 26 \text{ in}$   
 $P = 26 \text{ in}$

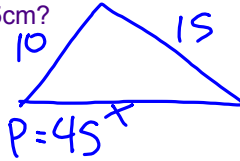
Area of rectangle:  $A = 5 \cdot 5 = 25 \text{ in}^2$

Area of triangle:  $A = \frac{b \cdot h}{2}$   
 $A = \frac{4 \cdot 5}{2} = 10 \text{ in}^2$

Total Area:  $25 \text{ in}^2 + 10 \text{ in}^2$   
 $A = 35 \text{ in}^2$

**Ex. 5 Solve the following.**

- a. What is the length of the third side of a triangle if one side measures 10cm, the second measures 15 cm and the perimeter is 45cm?

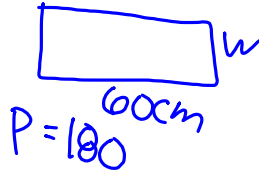


$$P = a + b + c$$

$$45 = 10 + 15 + c$$

$$\begin{array}{r} -10 \\ -15 \\ \hline c = 20 \text{ cm} \end{array}$$

- b. How wide is a rectangle if the length is 60cm and the perimeter is 180cm?



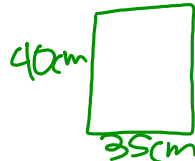
$$P = 2l + 2w$$

$$180 \text{ cm} = 2 \cdot 60 + 2w$$

$$180 = 120 + 2w$$

$$\begin{array}{r} -120 \\ \hline 60 = 2w \\ \frac{60}{2} = \frac{2w}{2} \\ \hline 30 = w \end{array}$$

1. A painting measures 40 cm by 35cm. How many squared cm does its surface cover? *area*



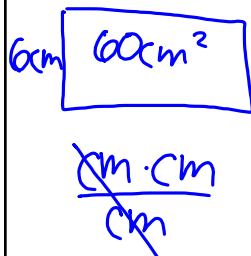
$$A = l \cdot w$$

$$A = 35 \cdot 40$$

$$A = 1400 \text{ cm}^2$$

- d. If the area of a rectangle is 60 cm<sup>2</sup> and its width is 6 cm.

What is its length?



$$A = l \cdot w$$

$$\frac{60 \text{ cm}^2}{6 \text{ cm}} = \frac{l \cdot 6 \text{ cm}}{6 \text{ cm}}$$

$$10 \text{ cm} = l$$