

## 2.4 GEOMETRY PROBLEMS & STRATEGIES

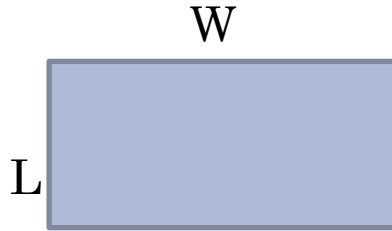
### Learning Intention:

To calculate simplified perimeter and area of shapes using our knowledge of algebra.

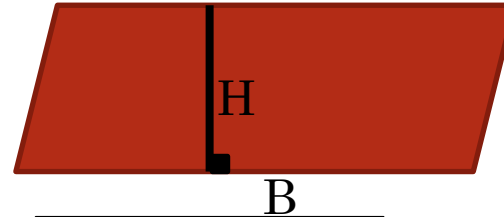
# STUFF YOU SHOULD KNOW BY NOW...I HOPE.



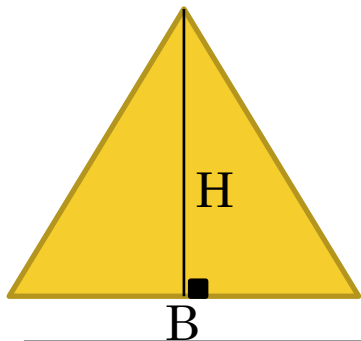
$$P = 4s$$
$$A = s^2$$



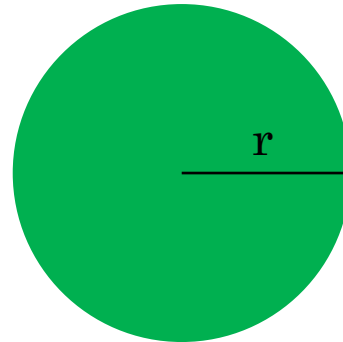
$$P = 2W + 2L$$
$$A = L \cdot W$$



$$A = B \cdot H$$



$$A = (B \cdot H) \div 2$$



$$A = \pi r^2$$



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



# THE WORD PROBLEM CHECKLIST

- 1) No diagram? Make one. Label it. Don't complain, just do it.
- 2) Underline/Highlight **KEY WORDS**
- 3) Identify **WHAT YOU KNOW**.
- 4) Identify **WHAT YOU HAVE TO FIND**.
- 5) Always write the **FORMULA**. Every time.
- 6) Plug in (substitute) your values, *and use brackets!*
- 7) Show all calculations.
- 8) Write a full answer, with **UNITS**.



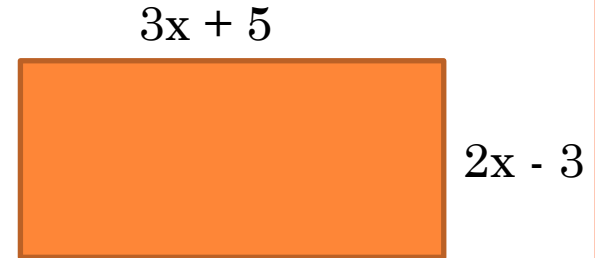
# TYPES OF PROBLEMS YOU'LL SEE

- Perimeter (distance around the outside).
  - ADDING & SUBTRACTING!
  - “What is the distance around...”
  - “How long is the fence...”
- Area or Volume
  - Multiplying & Dividing (maybe even FOIL!)
  - “What is the area of the room/yard/garden...”
  - “How much paint do I need...”



# EXAMPLE 1: PERIMETER

What is the perimeter of this rectangle?



$P = 2L + 2W$     **Always start with formula!**

$$= 2(3x + 5) + 2(2x - 3)$$

$$= 6x + 10 + 4x - 6$$

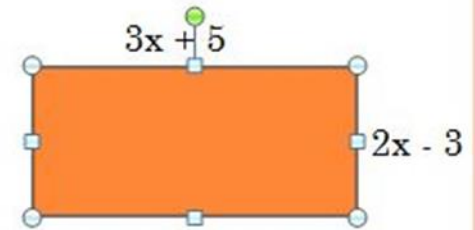
$$= 10x + 4$$

The perimeter is  $10x + 4$  units long



## EXAMPLE 2: CALCULATE THE AREA

$$\begin{aligned}\text{Area} &= l \times w \\ &= (3x + 5)(2x - 3) \\ &= 6x^2 - 9x + 10x - 15 \\ \text{Area} &= 6x^2 + x - 15\end{aligned}$$



## EX 3: FIND THE SHADED AREA

A gardener plants a rectangular flower bed in the middle of her yard as shown in the diagram. The rest of her yard is lawn. The dimensions are in metres. What is the area of the lawn?

STEP 1:

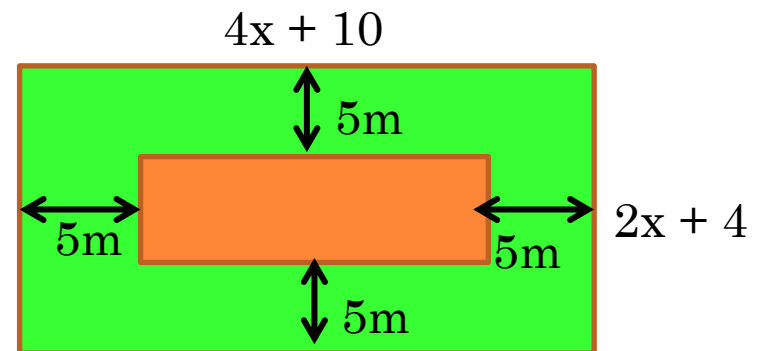
Find area of whole yard!

$$A = L \times W$$

$$= (4x + 10)(2x + 4)$$

$$= 8x^2 + 16x + 20x + 40$$

$$= 8x^2 + 36x + 40 \text{ m}^2$$



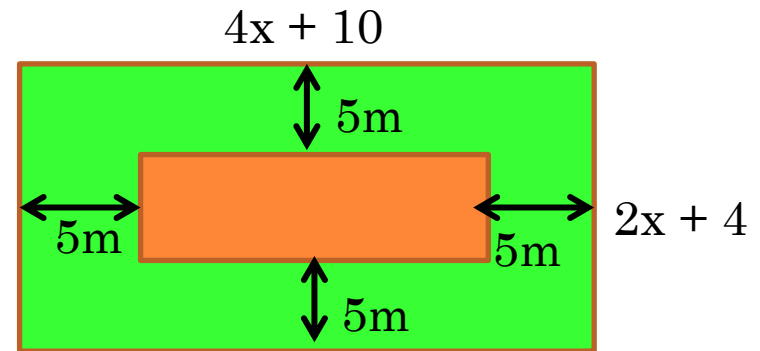
## EX 3: FIND THE SHADED AREA

STEP 2:

Find length and width  
of garden

$$\begin{aligned}L &= (4x + 10) - 5 - 5 \\ &= 4x + 10 - 10 \\ &= 4x\end{aligned}$$

$$\begin{aligned}W &= (2x + 4) - 5 - 5 \\ &= 2x + 4 - 10 \\ &= 2x - 6\end{aligned}$$





## EX 3: FIND THE SHADED AREA

STEP 3:

Find area of garden

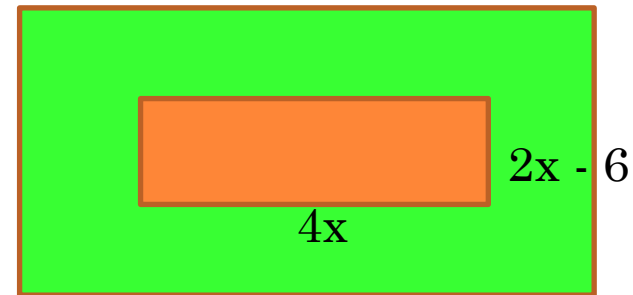
$$A = L \times W$$

$$= (4x)(2x - 6)$$

$$= (4x)(2x) + (4x)(-6)$$

$$= 8x^2 + -24x$$

$$= 8x^2 - 24x$$



Now, subtract the two areas to find the lawn!

$$(8x^2 + 36x + 40) - (8x^2 - 24x)$$

$$= 8x^2 + 36x + 40 - 8x^2 + 24x$$

$$= 60x + 40$$

**The area of the lawn  
is  $60x + 40 \text{ m}^2$**

## REMINDERS:

- 1) Watch for key words! (*increase, decrease, area, perimeter, etc.*)
- 2) Always start with the formula.
- 3) Always show the substitution step
- 4) Always include the UNITS
- 5) Always finish with a word answer!

Every problem “looks” different, but we really can only ask you a few different types of questions!

