Order of Operations

In math, the order of operations is
• work in brackets first
• if there are multiple brackets, do the innermost ones first
• multiply or divide in order from left to right
• add or subtract in order from left to right

> You used the order of operations in Chapter 2.

For example,

$3 + 5 \times 6 \div 2$ Multiply or divide from left to right.
$= 3 + 30 \div 2$
$= 3 + 15$ Add or subtract from left to right.
$= 18$

$(3 + 5) \times 6 - 2$ Brackets.
$= 8 \times 6 - 2$ Multiply or divide from left to right.
$= 48 - 2$ Add or subtract from left to right.
$= 46$

1. Evaluate.

a) $8 + 3 \times 2 - 6$

b) $4.8 \div (2 \times 2) + 3.1$

c) $(1.4 + 3.1) \times 2 \div 3$

2. What is the missing number??

a) $\blacksquare + 3 \times 25 = 125$

b) $5.5 \div 5 + \blacksquare = 4.7$

c) $8.2 - \blacksquare \div 2 = 2.6$

Work With Formulas

When you work with a formula, substitute what you know, and evaluate using the order of operations.

Calculate the perimeter and the area of this rectangle.

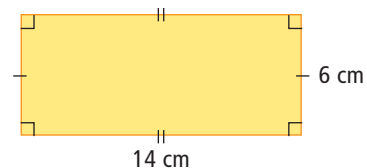The formula for perimeter of a rectangle is $P = 2(l + w)$.
$P = 2(l + w)$
$P = 2(14 + 6)$
$P = 2(20)$
$P = 40$

The perimeter of the rectangle is 40 cm.

The formula for area of a rectangle is $A = l \times w$.
$A = l \times w$
$A = 14 \times 6$
$A = 84$

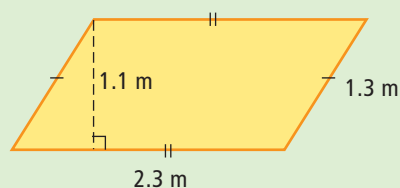The area of the rectangle is 84 cm².

6 cm
14 cm

3. What are the perimeter and area of a square with sides of 5.2 cm?

5.2 cm
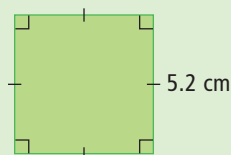
4. What are the perimeter and area of a rectangle with sides of 6 cm and 9 cm?

6 cm

9 cm
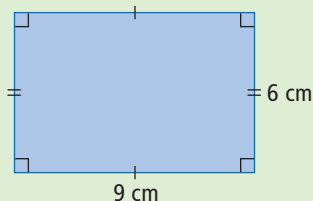
5. What are the perimeter and area of this parallelogram?

1.1 m

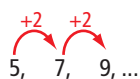1.3 m

2.3 m

Area of a parallelogram = $b \times h$.

6. If the height of the parallelogram in #5 is unchanged and the area is 3.5 m², what is the length of the base of the parallelogram?

Identify and Extend Patterns

When you work with a number pattern, ask yourself two questions:
• What number starts the pattern?
• How do the values change from one item to the next?

Look at the pattern

+2   +2

5,   7,   9, ...

The pattern starts at 5.
The numbers change by adding 2 each time.

You can describe this number pattern as follows:
$5 = 5$
$7 = 5 + 2$
$9 = 5 + 2 + 2$

Can you think of another way to describe this number pattern?

The next two numbers are 11 and 13.

7. Describe each number pattern. Identify the next two numbers in each pattern.

a) 4, 8, 12, ...

b) 5, 10, 15, ...

c) 24, 20, 16, ...

8. Copy and complete each number pattern.

a) 3, 6, 9, ■, ■, ■

b) 24, 18, 12, ■, ■, ■

c) 2, 5, 8, ■, ■, ■