# Chapter 8

## Get Ready

Name: _____     Date: _____
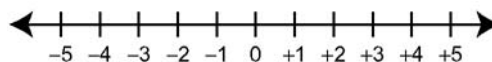
## Represent Quantities with Integers

**Integers** include positive and negative whole numbers and zero.
An integer is any of the numbers
…, −3, −2, −1, 0, +1, +2, +3, … .



**Integer chips** are coloured disks that represent integers. A ⊕ represents +1, and a ⊖ represents −1.
- If you climb five steps, this amount can be represented by the integer +5.
- If you descend ten steps, this amount can be represented by the integer −10.

**1.** Use an integer to represent each quantity. Explain your reasoning.

  **a)** an increase of 3%

  **b)** 20 m below sea level

  **c)** a drop of 8 °C

  **d)** 15 marks higher

**2.** Suppose you win a prize of $15. Use an integer to describe what happens

  **a)** from your point of view

  **b)** from the point of view of the person giving the prize

## Adding Integers

A **zero pair** includes one ⊕ and one ⊖.
A zero pair represents zero.
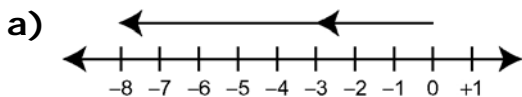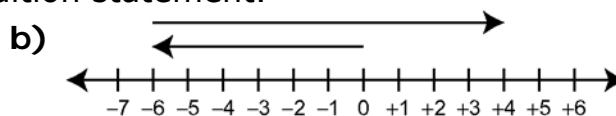Integer addition can be modelled using integer chips or diagrams.

⊕
⊖
zero pair

**3.** Use the diagram to complete each addition statement.

  **a)** ⊕⊕⊕⊕⊕⊕⊕  $(+7) + (−4) = \square$
       ⊖⊖⊖⊖

  **b)** ⊖⊖⊖⊖⊖⊖⊖⊖  $(−8) + (+3) = \square$
       ⊕⊕⊕

**4.** Use the diagram to complete each addition statement.

  **a)**



  $(−3) + (−5) = \square$

  **b)**



  $(−6) + (+10) = \square$

**5.** Complete each addition statement.

**a)** $(+4) + (+5) = \boxed{\phantom{xx}}$     **b)** $(-7) + (-7) = \boxed{\phantom{xx}}$

**c)** $(+6) + (-9) = \boxed{\phantom{xx}}$     **d)** $(-2) + (+8) = \boxed{\phantom{xx}}$

## Subtracting Integers

Integer subtraction can be modelled using integer chips or diagrams.
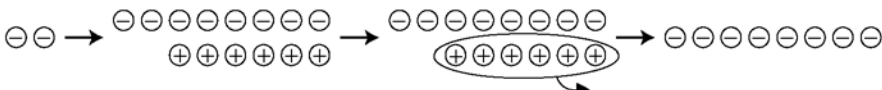Any integer subtraction can be completed by adding the opposite integer.

$(+5) - (-4) = (+5) + (+4)$
$\phantom{(+5) - (-4)} = +9$

**6.** Use the diagram to complete each subtraction statement.

**a)** 

$(+7) - (+4) = \boxed{\phantom{xx}}$

**b)** 

$(-6) - (-2) = \boxed{\phantom{xx}}$

**c)** 

$(-2) - (+6) = \boxed{\phantom{xx}}$

**d)** 

$(-4) - (-7) = \boxed{\phantom{xx}}$
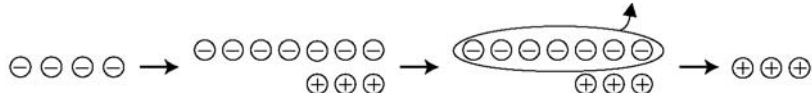
**7.** Complete each statement.

**a)** $(+4) - (+7) = (+4) + \boxed{\phantom{xx}}$

**b)** $(-5) - (-2) = (-5) + \boxed{\phantom{xx}}$

**c)** $(-8) - (+8) = (-8) + \boxed{\phantom{xx}}$

**8.** Subtract.

**a)** $(+6) - (+1)$   **b)** $(-3) - (+5)$

**c)** $(+2) - (-2)$   **d)** $(-3) - (+2)$

**e)** $(-6) - (-9)$   **f)** $(+4) - (-1)$

## Order of Operations

The correct sequence of steps for a calculation follows the **order of operations** shown.

$8 \div 4 + (3 + 2) \times 6 - 7$        Do brackets first.
$= 8 \div 4 + 5 \times 6 - 7$        Multiply and divide from left to right.
$= 2 + 30 - 7$        Add and subtract from left to right.
$= 25$

**9.** Calculate.

**a)** $8 + 6 \times 5 - 1$        **b)** $24 \div 6 + 18 \div 2$

**c)** $3 \times (7 - 2) + 16 \div 4$        **d)** $(4 + 2) \div 6 + 6 \times 3 - 3$