

Integers

Every integer (except 0) has a corresponding one with the *opposite* sign.

$$5 \rightarrow \underline{\quad\quad} \quad -2 \rightarrow \underline{\quad\quad} \quad 321 \rightarrow \underline{\quad\quad} \quad -63 \rightarrow \underline{\quad\quad} \quad 10,109 \rightarrow \underline{\quad\quad\quad\quad}$$

Number Lines



Adding Integers Using a Number Line

When adding two integers using a # line, mark the first # on a number line.

⇒ If you are adding a *positive* integer, go to the *right* →

⇒ If you are adding a *negative* integer, go to the *left* ←

Example 1: Add the following using a Number Line

a) $-3 + 4 = \underline{\quad\quad}$

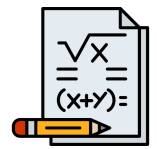
b) $(-2) + (-3) = \underline{\quad\quad}$



c) $5 + (-6) = \underline{\quad\quad}$

d) $(-1) + (-1) = \underline{\quad\quad}$





Example 2: Adding Integers Without Models

a) $-6 + (-4) = \underline{\hspace{2cm}}$

b) $-6 + 4 = \underline{\hspace{2cm}}$

c) $-10 + 12 = \underline{\hspace{2cm}}$

d) $23 + (-21) = \underline{\hspace{2cm}}$

e) $-10 + (-7) = \underline{\hspace{2cm}}$

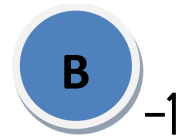
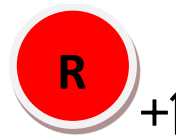
f) $-9 + (-4) = \underline{\hspace{2cm}}$

Adding Integers Using Integer Chips

We can use coloured chips to represent integers.

⇒ RED = Positive

⇒ BLUE = Negative

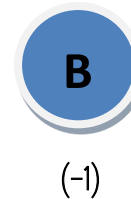


The Zero Principle

One RED chip and one BLUE chip form a pair and cancel each other out to equal 0.



+



= 0

When adding two integers, use the zero principle and remove sets of *zero pair*. Whatever remains will be your answer

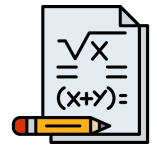
Example 3: Use Integer chips to model and answer the following.

a) $(+3) + (+2) = \underline{\hspace{2cm}}$

b) $5 + (-6) = \underline{\hspace{2cm}}$

c) $(-2) + (-1) = \underline{\hspace{2cm}}$

d) $(-3) + (+5) = \underline{\hspace{2cm}}$



Subtracting Integers Using Integer Chips

When subtracting two integers, change the subtraction to addition and switch the sign on the second integer, and do the same as adding integers.

Example 4: Subtracting Integers with chips

a) $-3 - (-6) = \underline{\quad}$

b) $-1 - (-4) = \underline{\quad}$

c) $5 - (-3) = \underline{\quad}$

d) $-3 - 5 = \underline{\quad}$

Examine the above examples and complete the following statements...

⇒ Subtracting a *positive* integer is equivalent to adding a *negative* integer.

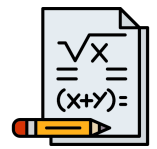
⇒ Subtracting a *negative* integer is equivalent to adding a *positive* integer.

Subtracting Integers without Models

Subtracting an integer is *equivalent to adding the opposite integer*.

To subtract, change from a subtraction question to an addition question and evaluate using your knowledge about integer addition.

Math 8
Integers – Adding & Subtracting



Example 5: Subtracting Integers Without Models

- a) $-6 - (-4) = \underline{\hspace{2cm}}$ b) $-6 - 4 = \underline{\hspace{2cm}}$ c) $-10 - 12 = \underline{\hspace{2cm}}$
- d) $23 - (-21) = \underline{\hspace{2cm}}$ e) $-10 - (-7) = \underline{\hspace{2cm}}$ f) $-9 - (-4) = \underline{\hspace{2cm}}$
- g) $(+3) - (+2) = \underline{\hspace{2cm}}$ h) $5 - (-6) = \underline{\hspace{2cm}}$ i) $(-2) - (-1) = \underline{\hspace{2cm}}$
- j) $(-3) - (+5) = \underline{\hspace{2cm}}$ k) $7 - (-8) = \underline{\hspace{2cm}}$ l) $-10 - 8 = \underline{\hspace{2cm}}$
- m) $-5 - (-14) = \underline{\hspace{2cm}}$ n) $-12 - 7 = \underline{\hspace{2cm}}$ o) $30 - (-6) = \underline{\hspace{2cm}}$

Application & Practice

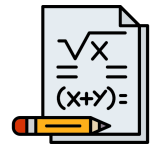
1. What is the mathematical value for each of the following situations?

- a) The temperature outside is 10°C below zero. _____
- b) The water level is 4m below sea level. _____
- c) A loss of \$200. _____

2. In the table below determine the New Temperature by creating a math expression using integers.

Original Temperature	Temperature Change	Math Expression	New Temperature
13°C	Decreases by 9°C		
2°C	Decreases by 5°C		
-2°C	Increases by 3°C		
-9°C	Decreases by 3°C		

Math 8
Integers – Adding & Subtracting



- Tom has \$50 in his wallet. He spends \$20 on lunch and then receives \$30 as a birthday gift. What is the total amount of money in his wallet now? Create an expression using integers.
- Sarah is at the beach, and she swims 10 meters out into the ocean. Later, she decides to swim back to the shore for 6 meters. What is her distance from the shore? Create an expression using integers.
- In a football game, a team loses 7 yards on one play and gains 12 yards on the next play. What is the total (i.e. net) yardage gained or lost? Create an expression using integers.
- A submarine descends 200 meters below sea level and then ascends 150 meters. What is the submarine's final depth relative to sea level? Create an expression using integers.