8. [Integers +,–]

Skill 8.1 Adding integers.

MM9 1 1 2 2 3 3 4 4
MM10 1 1 2 2 3 3 4 4

- Use these sign rules:

If same: + + = +

Example: (–9) + (+3)
= –9 + 3 (+ + = +)
= –6

- Subtract the numbers and keep the sign in front of the greatest integer.

If different: + – = –

Example: (–9) + (–3)
= –9 – 3 (+ – = –)
= –12

- Add the numbers and keep the minus sign.

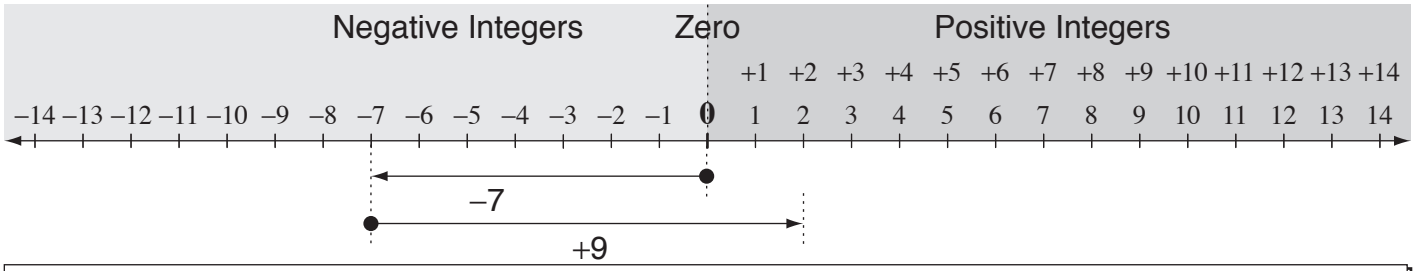
Hint: The sign of a number should not be confused with the operations of addition or subtraction.

(+5) + (–8) = 5 + –8 = –3

(No sign so +5 (positive 5)) (Negative sign attached to 8)

Hint: Every number has a sign attached to it, so if there is no sign, the number is positive.

- The sign can also be visualised using a number line.
Hint: '–' means move left or backwards and '+' means move right or forwards.



Q. (–7) + (+9) =

A. (–7) + (+9)
= –7 + 9 (+ + = +)
= 2 (start at –7, move forward 9)

a) (+5) + (–7) = (+ – = –) (subtract, keep "–")
= 5 – 7 = **–2**

b) (–4) + (–8) =
= –4 = ☐

c) (–5) + (–3) =
= ..... = ☐

d) (+2) + (–8) =
= ..... = ☐

e) (+4) + (–6) =
= ..... = ☐

f) (–7) + (+4) =
= ..... = ☐

g) (–3) + (+6) =
= ..... = ☐

h) (+5) + (–8) =
= ..... = ☐

i) (+2) + (–14) =
= ..... = ☐

j) (–16) + (+9) =
= ..... = ☐

k) (–15) + (–8) =
= ..... = ☐

l) 2 + –7 =
= ..... = ☐

Skill 8.2 Subtracting integers.

- Use these sign rules:

If same: – – = +

Example: (–9) – (–3)
= –9 + 3
= –6

– – = +

- Subtract the numbers and keep the sign in front of the greatest integer.

If different: – + = –

Example: (–9) – (+3)
= –9 – 3
= –12

– + = –

- Add the numbers and keep the minus sign.

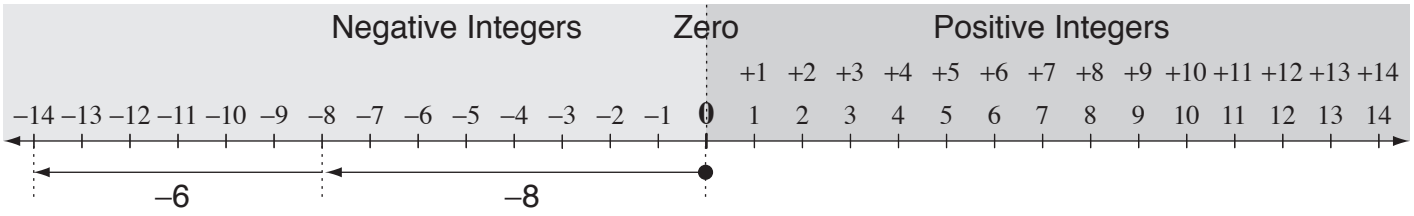
Hint: The sign of a number should not be confused with the operations of addition or subtraction.

(+5) – (–8) = 5 – –8 = 5 + 8 = 13

No sign so +5 (positive 5) | Negative sign attached to 8

Hint: Every number has a sign attached to it, so if there is no sign, the number is positive.

- The sign of the result of the subtraction can also be visualised using a number line.
Hint: '–' means move left or backwards and '+' means move right or forwards.



Q. (–8) – (+6) =

A. (–8) – (+6)
+ – = –
= –8 – 6
= –14
start at –8, move backward 6

a) (–5) – (–6) = – – = +
= –5 + 6 = 1

b) (+3) – (+9) = subtract, keep "–"
= 3 – 9 =

c) (+7) – (+8) =
= =

d) (+7) – (–7) =
= =

e) (–3) – (–2) =
= =

f) (–4) – (–8) =
= =

g) (+6) – (–7) =
= =

h) (+4) – (–9) =
= =

i) (–19) – (+11) =
= =

j) (–16) – (+9) =
= =

k) (–12) – (–15) =
= =

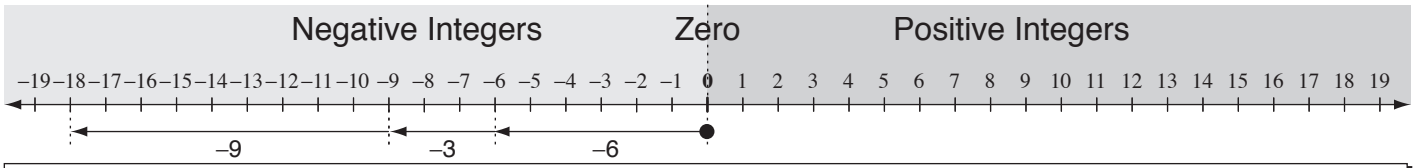
l) –6 – –3 =
= =

Skill 8.3 Adding and subtracting integers.

- Add and/or subtract from left to right.
- Use these sign rules:

If same:	If different:
+ + = +	+ − = −
− − = +	− + = −

- The sign of the result can also be visualised using a number line.



Q. (–6) – (+3) – (+9) =

A. *(–6) – (+3) – (+9)*
= –6 – 3 – 9 (– + = –)
= –9 – 9 (work from left to right)
= –18 (start at –9, move backward 9 more)

a) (–5) + (–6) + (+9) = (+ – = –) (+ + = +)

= *–5 – 6 + 9* (subtract, keep "–")
= *–11 + 9* = **–2**

b) (+1) – (–7) – (–7) = (– – = +)

= *1 +* ..... = ...

c) (+9) + (–6) – (–2) =

= ..... = ...

d) (–8) – (–5) + (+4) =

= ..... = ...

e) (–2) + (–6) – (–9) =

= ..... = ...

f) (+5) – (+7) – (–8) =

= ..... = ...

g) (+3) – (–6) + (–8) =

= ..... = ...

h) (+5) + (–4) – (+3) =

= ..... = ...

i) (–2) – (–6) – (+7) =

= ..... = ...

j) (+7) + (+15) + (–19) =

= ..... = ...

k) (–12) – (–13) + (+15) =

= ..... = ...

l) (–14) – (+16) + (+18) =

= ..... = ...

m) 8 – 2 – –7 =

= ..... = ...

n) 5 + –7 + –9 =

= ..... = ...

o) –6 + 5 + –8 =

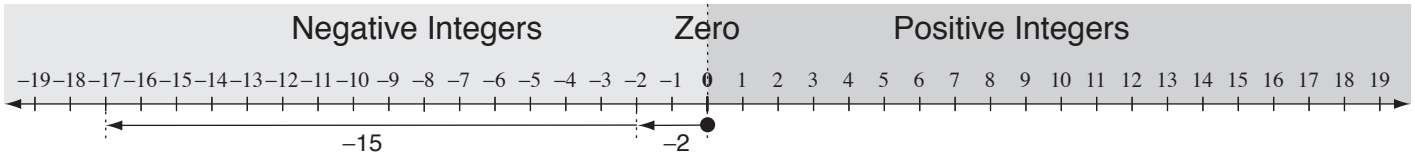
= ..... = ...

Skill 8.4 Adding and subtracting integers using order of operations.

- Complete the operations in the correct order.
  1. Simplify within brackets.
  2. Add and/or subtract from left to right.
- Use these sign rules:

If same:	If different:
+ + = +	+ – = –
– – = +	– + = –

- The sign of the result can also be visualised using a number line.



Q. $(5 - 7) - (6 + 9) =$

A. $(5 - 7) - (6 + 9)$ — complete the brackets first
$= (-2) - (+15)$ — – + = –
$= -2 - 15$ — start at –2, move backward 15 more
$= -17$

a) $4 + (-6 + 3) =$ — brackets first
$= 4 + (-3)$ — + – = –
$= 4 - 3 =$ 1

b) $2 + (4 - 9) =$
$= 2 + (-5)$
$=$ $=$

c) $7 + (3 - 8) =$
$=$
$=$ $=$

d) $4 - (9 - 7) =$
$=$
$=$ $=$

e) $5 - (-8 + 6) =$
$=$
$=$ $=$

f) $6 + (-5 - 4) =$
$=$
$=$ $=$

g) $(2 - 5) - (3 + 4) =$ — brackets first
$= (-3) - (+7)$ — – + = –
$= -3 - 7 =$ — add, keep "–"

h) $(8 - 4) + (3 - 9) =$
$=$
$=$ $=$

i) $(5 - 9) - (9 - 5) =$
$=$
$=$ $=$

j) $(5 + 6) - (4 - 11) =$
$=$
$=$ $=$

k) $(3 - 8) + (9 - 14) =$
$=$
$=$ $=$

l) $(-8 - 6) - (7 - 13) =$
$=$
$=$ $=$

Skill 8.5 Finding missing integers using addition and subtraction.

- Circle the positive integer (no sign) or negative integer ('–' sign) that is on the side of the unknown.
  Hint: Don't confuse the sign with the operation. (see skill 8.1, page 80)
- Use the inverse operations of addition or subtraction to remove the circled integer from the side of the unknown.
  Hint: e.g. +6 added to –6 will cancel each other and leave zero as the result.
- Perform the same operation on the other side of the equation.
- If the unknown has a negative attached, add another negative to both sides of the equation.
  Hint: '– – = +' i.e. The sign of the unknown will become its inverse, a '+'.

Q. $-6 - \square = 8$

A.
$-6 - x = 8$ (Use inverse of –6)
$-6 - x + 6 = 8 + 6$ (+6 to both sides; cancel)
$-x = 8 + 6$ (Use inverse of '–' : – – = +)
$- -x = -14$
$x = -14$

a) $\boxed{-8} + (-4) = -12$

$x + -4 + 4 = -12 + 4$

$x = -8$

b) $\square - (3) = -5$

$x - 3 + 3 = -5 + 3$

c) $4 + \square = -3$

$4 + x$

d) $\square - -6 = -9$

e) $-5 + \square = 13$

f) $-8 + \square = -3$

g) $\square + -4 = -8$

h) $\square - -6 = 1$

i) $\square + 7 = -4$

j) $9 - \boxed{11} = -2$

$9 - x - 9 = -2 - 9$

$-x = -11$

$- -x = - -11$ (– – = +)

k) $-6 - \square = 7$

l) $-9 - \square = -3$