Christian Alliance College

Mathematics

Form 1 _____ Chapter 2：Directed Number

Name: _____

Class: _____ (_____) Date: _____

Addition and Subtraction of Directed Numbers by Removing Brackets

I. Rules for Removing Brackets

Key Points

Rules of removing brackets:

For a number a, a positive number $+b$ and a negative number $-b$,

(i) $a + (+b) = a + b$ (iii) $a + (-b) = a - b$

(ii) $a - (-b) = a + b$ (iv) $a - (+b) = a - b$

In each of the following, write down either an addition sign '+' or a subtraction sign '–' in the box provided. **(1 – 2)**

1. **(a)** +1 + (+4) = 1 ☐ 4 **(b)** +2 – (–2) = 2 ☐ 2

(c) –3 – (+6) = –3 ☐ 6 **(d)** –8 + (–4) = –8 ☐ 4

2. **(a)** –8 + (+4) – (+9) = –8 ☐ 4 ☐ 9 **(b)** +5 + (–7) – (–6) = 5 ☐ 7 ☐ 6

II Addition and Subtraction of Directed Numbers on a Number Line

Key Points

Addition and subtraction of directed numbers by using the number line

1. When adding a positive (negative) number to a directed number, move to the right (left) of the given directed number on the number line.
2. When subtracting a positive (negative) number from a directed number, move to the left (right) of the given directed number on the number line.

Example 1 (Level 1)

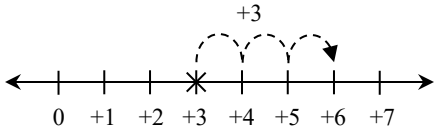
With the help of a number line, find the values of the following expressions.

(a) (+3) + (+3)

(b) (–5) + (+8)

Solution

(a)



$(+3)+(+3)=+6$

Let's Try 1

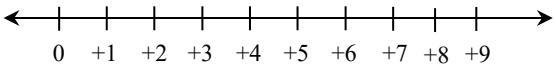
With the help of a number line, find the values of the following expressions.

(a) (+1) + (+8)

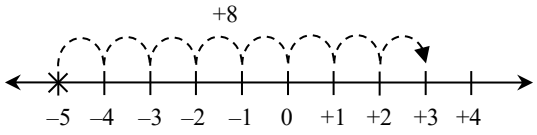
(b) (–9) + (+5)

Solution

(a) (+1) + (+8)



(b) (–5) + (+8)



$(-5)+(+8)=\underline{\underline{+3}}$

(b) (–9) + (+5)

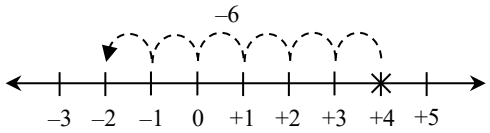
Example 2 (Level 1)

With the help of a number line, find the values of the following expressions.

(a) (+4) + (–6) **(b)** (–5) + (–5)

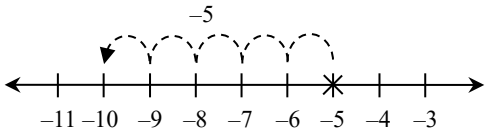
Solution

(a)



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

(b)



$(-5)+(-5)=\underline{\underline{-10}}$

Let's Try 2

With the help of a number line, find the values of the following expressions.

(a) (+3) + (–5) **(b)** (–1) + (–4)

Solution

(a)

(b)

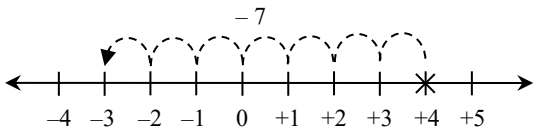
Example 3 (Level 1)

With the help of a number line, find the values of the following expressions.

(a) (+4) – (+7) **(b)** (–6) – (+2)

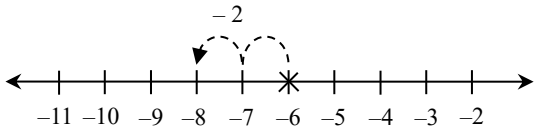
Solution

(a)



$(+4)-(+7)=\underline{\underline{-3}}$

(b)



$(-6)-(+2)=\underline{\underline{-8}}$

Let's Try 3

With the help of a number line, find the values of the following expressions.

(a) (+3) – (+4) **(b)** (–3) – (+5)

Solution

(a)

(b)

Example 4 (Level 1)

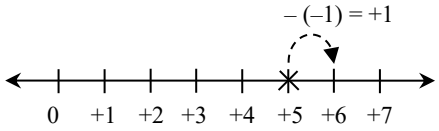
With the help of a number line, find the values of the following expressions.

(a) (+5) – (–1)

(b) (–4) – (–2)

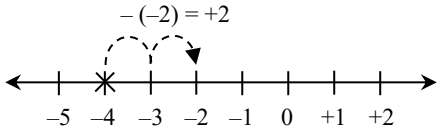
Solution

(a)



$(+5)-(-1)=\underline{\underline{+6}}$

(b)



$(-4)-(-2)=\underline{\underline{-2}}$

Let's Try 4

With the help of a number line, find the values of the following expressions.

(a) (–6) – (–1)

(b) (–4) – (–6)

Solution

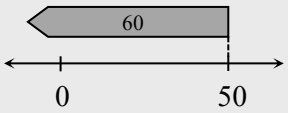
(a)

(b)

Key Points

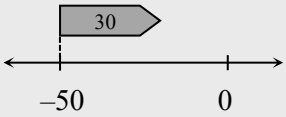
Evaluate the sum or the difference of the directed numbers

e.g. (i)



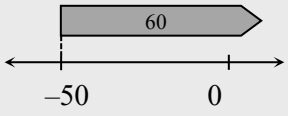
50 – 60 = –10

(ii)



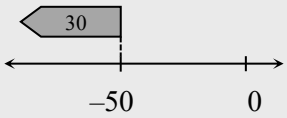
–50 + 30 = –20

(iii)



–50 + 60 = +10

(iv)



–50 – 30 = –80

Example 5 (Level 1)

Find the values of the following expressions by removing brackets.

(–5) + (+12)

Solution

$(-5)+(+12)$

$=-5+12$

$=\underline{\underline{7}}$

The solving steps are as follows:

1. Remove all the brackets.
2. Evaluate the sum or the difference of the magnitudes of the numbers.

Let's Try 5

Find the values of the following expressions by removing brackets.

(–8) + (+2)

Solution

Example 6 (Level 1)

Find the values of the following expressions by removing brackets.

(a) (+4) – (+10)

(b) (–12) – (–26)

Solution

(a) $(+4)-(+10)$
$=4-10$
$=\underline{\underline{-6}}$

Note that
$4 - 10 \neq 10 - 4$.

(b) $(-12)-(-26)$
$=-12+26$
$=\underline{\underline{14}}$

Let's Try 6

Find the values of the following expressions by removing brackets.

(a) (–7) – (+15)

(b) (–42) – (–24)

Solution

(a)

(b)

Example 7 (Level 2)

Find the values of the following expressions by removing brackets.

(a) (–4) – (–7) – (+9)

(b) (–2.5) + (–6.5) – (–7.5)

Solution

(a) $(-4)-(-7)-(+9)=-4+7-9$
$=3-9$
$=\underline{\underline{-6}}$

(b) $(-2.5)+(-6.5)-(-7.5)=-2.5-6.5+7.5$
$=-9+7.5$
$=\underline{\underline{-1.5}}$

Let's Try 7

Find the values of the following expressions by removing brackets.

(a) (–7) – (–5) + (–1)

(b) (+2.6) – (–3.4) + (–7.1)

Solution

(a)

(b)