Unit 2 Integers

Exercise 2.1

1. Write the next four integers.

(i) −1, 0

Solution: To write next four integers count forward. So, 1, 2, 3, 4 are the next four integers.

(ii) −5, −4

Solution: To write next four integers count forward. So, −3, −2, −1, 0 are the next four integers.

(iii) 0, 1, 2

Solution: To write next four integers count forward. So, 3, 4, 5, 6 are the next four integers.

(iv) −2, −1

Solution: To write next four integers count forward. So, 0, 1, 2, 3 are the next four integers.

2. Represent the following integers on the number line.

(i) −9

Solution: First of all, draw the number line and write integers on it at equal distance.

(ii) 15

Solution: First of all, draw the number line and write integers on it at equal distance.

(iii) −12

Solution: First of all, draw the number line and write integers on it at equal distance.

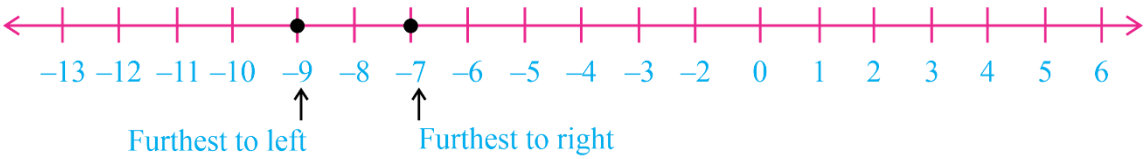
(iv) 27

Solution: First of all, draw the number line and write integers on it at equal distance.

3. Using number line find which is the greater integer of the pair given below.

(i) −7, −9

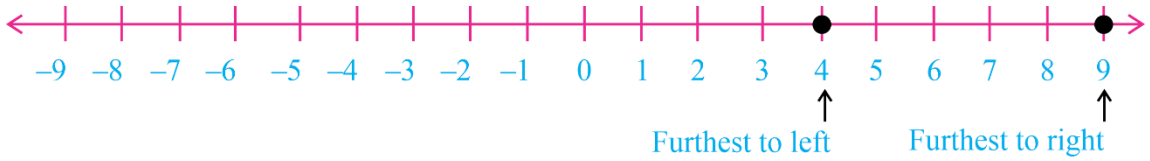
Solution: First of all, represent both integers on the number line.



In case of two negative integers smaller number (with negative sign) is always greater than the bigger number (with negative sign). So, −7 is greater integer.

(ii) 4, 9

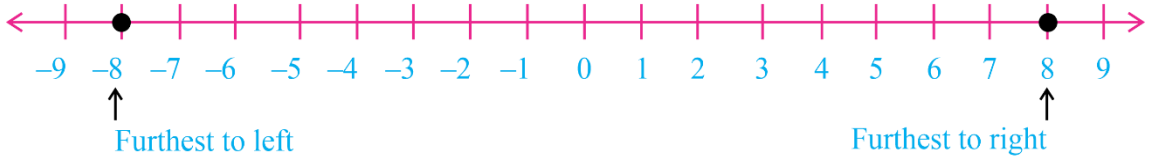
Solution: First of all, represent both integers on the number line.



Any integer which is furthest to right on number line is always a greater integer than to left integers. So, 9 is greater than 4.

(iii) −8, 8

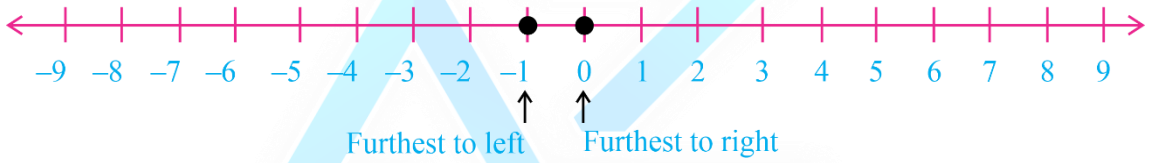
Solution: First of all, represent both integers on the number line.



A positive integer is always greater than a negative integer. So, 8 is greater than −8.

(iv) 0, −1

Solution: First of all, represent both integers on the number line.



All negative numbers are less than 0. So, 0 is greater than −1.

4. Arrange the following integers in ascending order.

(i) −7, 7, 9, 11, 13, 0, −3

Solution: To arrange the given integers in ascending order. Firstly, compare the integers and find the smallest and the greatest integer. Secondly, compare remaining integers one by one and arrange them from the smallest to the greatest. So, Ascending order = −7, −3, 0, 7, 9, 11, 13

(ii) −11, 13, 14, −9, 0, −1, −2

Solution: To arrange the given integers in ascending order. Firstly, compare the integers and find the smallest and the greatest integer. Secondly, compare remaining integers one by one and arrange them from the smallest to the greatest. So, Ascending order = −11, −9, −2, −1, 0, 13, 14

(iii) 5, 4, −4, −5, −3, −2, 2

Solution: To arrange the given integers in ascending order. Firstly, compare the integers and find the smallest and the greatest integer. Secondly, compare remaining integers one by one and arrange them from the smallest to the greatest. So, Ascending order = −5, −4, −3, −2, 2, 4, 5

(iv) −5, −7, −3, −11, −13, −4

Solution: To arrange the given integers in ascending order. Firstly, compare the integers and find the smallest and the greatest integer. Secondly, compare remaining integers one by one and arrange them from the smallest to the greatest. So, Ascending order = −13, −11, −7, −5, −4, −3

5. Arrange the following integers in descending order.

(i) 11, 15, −11, 17, −9, −8, −3

Solution: To arrange the given integers in descending order. Firstly, compare integers and find the greatest and the smallest integer. Secondly, compare remaining integers one by one and arrange them from the greatest to the smallest. So, Descending order = 17, 15, 11, −3, −8, −9, −11

(ii) 0, 1, 2, −11, −9, 15, −15, 19

Solution: To arrange the given integers in descending order. Firstly, compare integers and find the greatest and the smallest integer. Secondly, compare remaining integers one by one and arrange them from the greatest to the smallest. So, Descending order = 19, 15, 2, 1, 0, −9, −11, −15

(iii) −18, −11, 9, 8, 3, 4, −5, −9

Solution: To arrange the given integers in descending order. Firstly, compare integers and find the greatest and the smallest integer. Secondly, compare remaining integers one by one and arrange them from the greatest to the smallest. So, Descending order = 9, 8, 4, 3, −5, −9, −11, −18

(iv) 14, 11, 9, 8, 7, 0, 3, 5, 17

Solution: To arrange the given integers in descending order. Firstly, compare integers and find the greatest and the smallest integer. Secondly, compare remaining integers one by one and arrange them from the greatest to the smallest. So, Descending order = 17, 14, 11, 9, 8, 7, 5, 3, 0

6. Find the absolute value of following integers.

(i) −9

Solution: The absolute value of −9 is 9 because absolute value of a negative or positive integer is always positive.

(ii) −a

Solution: The absolute value of −a is a because absolute value of a negative or positive integer is always positive.

(iii) 5

Solution: The absolute value of 5 is 5 because absolute value of a negative or positive integer is always positive.

(iv) a + b

Solution: The absolute value of a + b is a + b because absolute value of a negative or positive integer is always positive.

(v) −18

Solution: The absolute value of −18 is 18 because absolute value of a negative or positive integer is always positive.

(vi) 11

Solution: The absolute value of 11 is 11 because absolute value of a negative or positive integer is always positive.

7. Arrange the absolute value of the following integers in ascending and descending order.

(i) −9, 8, 3, 2, 15, −17, 19, −20, −23

Solution: First of all, find the absolute value of each given integer.

$|-9| = 9,\ |8| = 8,\ |3| = 3,\ |2| = 2,\ |15| = 15,\ |-17| = 17,\ |19| = 19,\ |-20| = 20,\ |-23| = 23$

So, absolute values are 9, 8, 3, 2, 15, 17, 19, 20, 23

Now, arrange the absolute values of given integers from the smallest to the greatest (ascending order) and the greatest to the smallest (descending order).

Ascending order = 2, 3, 8, 9, 15, 17, 19, 20, 23 Descending order = 23, 20, 19, 17, 15, 9, 8, 3, 2

(ii) 25, 28, −29, −17, −16, 0, 18, −21

Solution: First of all, find the absolute value of each given integer.

$|25| = 25,\ |28| = 28,\ |-29| = 29,\ |-17| = 17,\ |-16| = 16,\ |0| = 0,\ |18| = 18,\ |-21| = 21$

So, absolute values are 25, 28, 29, 17, 16, 0, 18, 21

Now, arrange the absolute values of given integers from the smallest to the greatest (ascending order) and the greatest to the smallest (descending order).

Ascending order = 0, 16, 17, 18, 21, 25, 28, 29 Descending order = 29, 28, 25, 21, 18, 17, 16, 0

(iii) −18, −11, 9, 8, 3, 4, −5, −9

Solution: First of all, find the absolute value of each given integer.

$|-18| = 18,\ |-11| = 11,\ |9| = 9,\ |8| = 8,\ |3| = 3,\ |4| = 4,\ |-5| = 5,\ |-9| = 9$

So, absolute values are 18, 11, 9, 8, 3, 4, 5, 9

Now, arrange the absolute values of given integers from the smallest to the greatest (ascending order) and the greatest to the smallest (descending order).

Ascending order = 3, 4, 5, 8, 9, 9, 11, 18 Descending order = 18, 11, 9, 9, 8, 5, 4, 3

(iv) 11, 15, −11, 17, −9, −8, −3

Solution: First of all, find the absolute value of each given integer.

$|11| = 11,\ |15| = 15,\ |-11| = 11,\ |17| = 17,\ |-9| = 9,\ |-8| = 8,\ |-3| = 3$

So, absolute values are 11, 15, 11, 17, 9, 8, 3

Now, arrange the absolute values of given integers from the smallest to the greatest (ascending order) and the greatest to the smallest (descending order).

Ascending order = 3, 8, 9, 11, 11, 15, 17 Descending order = 17, 15, 11, 11, 9, 8, 3

Exercise 2.2

1. Add the following integers.

(i) 17 + 18

Solution: To add two integers of like signs:

Step 1: Add the integers like whole numbers. i.e.

17 + 18 = 35

Step 2: Write the common sign with the result. Here common sign is '+' so the sum of 17 and 18 is 35.

17 + 18 = 35

Note: It is not necessary to write '+' with positive integer, it's obvious.

(ii) −93 + (10)

Solution: To add two integers of unlike signs:

Step 1: subtract the smaller integer from greater integer like whole numbers. Here, 93 is greater than 10. So, 93 − 10 = 83

Step 2: Write the sign of greater integer with the result. Here greater number is 93 which is negative so the sum of −93 and 10 is −83.

−93 + (10) = −83

(iii) 25 + (−32)

Solution: To add two integers of unlike signs:

Step 1: subtract the smaller integer from greater integer like whole numbers. Here, 32 is greater than 25. So 32 − 25 = 7

Step 2: Write the sign of greater integer with the result. Here greater number is 32 which is negative so the sum of 25 and −32 is −7.

25 + (−32) = −7

(iv) −67 + (−22)

Solution: To add two integers of like signs:

Step 1: Add the integers like whole numbers.

67 + 22 = 89

Step 2: Write the common sign with the result. Here common sign is '−' so the sum of −67 and −22 is −89.

−67 + (−22) = −89

(v) 97 + (−10)

Solution: To add two integers of unlike signs:

Step 1: subtract the smaller integer from greater integer like whole numbers. Here, 97 is greater than 10. So, 97 − 10 = 87

Step 2: Write the sign of greater integer with the result. Here greater number is 97 which is positive so the sum of 97 and −10 is 87.

97 + (−10) = 87

(vi) −52 + (−43)

Solution: To add two integers of like signs:

Step 1: Add the integers like whole numbers.

52 + 43 = 95

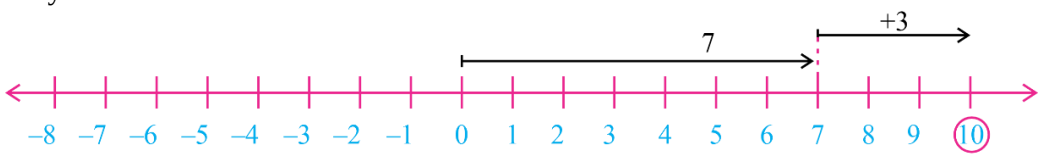
Step 2: Write the common sign with the result. Here common sign is '−' so the sum of −52 and −43 is −95.

−52 + (−43) = −95

2. Represent the sum of following integers on the number line.

(i) 7 and 3

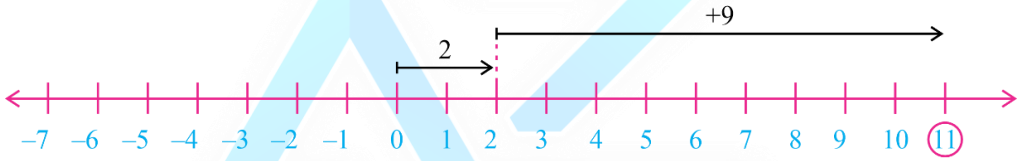
Solution: Identify both numbers on the number line.



Hence, 7 + 3 = 10

(ii) 2 and 9

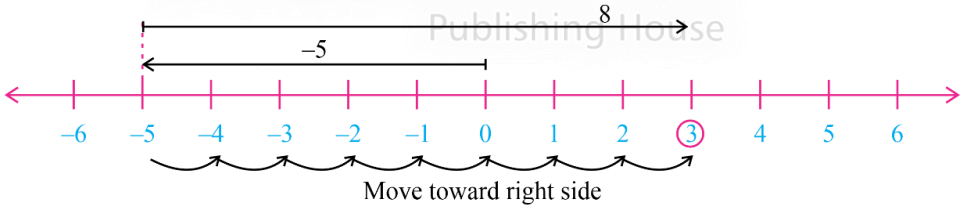
Solution: Identify both numbers on the number line.



Hence, 2 + 9 = 11

(iii) −5 and 8

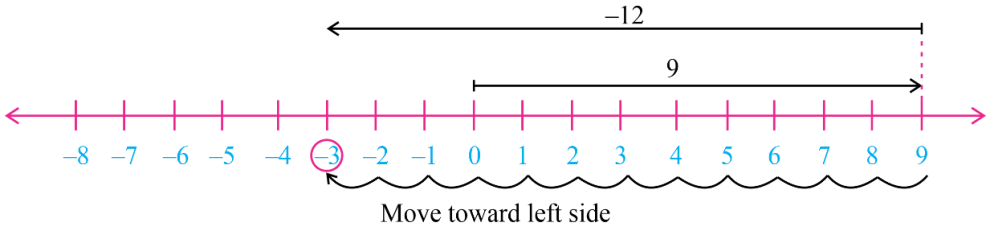
Solution: Identify both numbers on the number line.



Hence, −5 + 8 = 3

(iv) 9 and −12

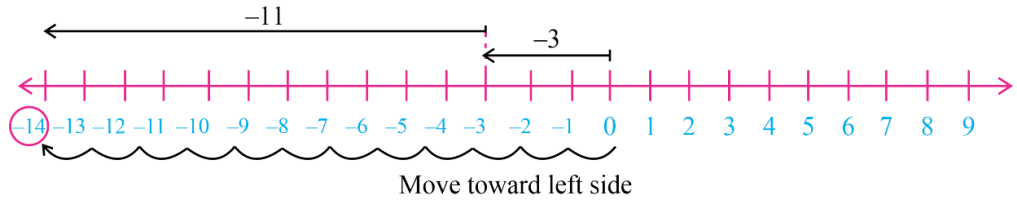
Solution: Identify both numbers on the number line.



Hence, 9 + (−12) = −3

(v) −3 and −11

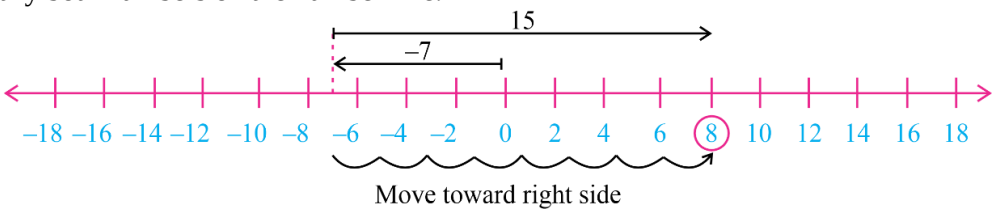
Solution: Identify both numbers on the number line.



Hence, (−3) + (−11) = −14

(vi) −7 and 15

Solution: Identify both numbers on the number line.



Hence, −7 + 15 = 8

3. Subtract the following integers.

(i) 71 from 98

Solution: To subtract two positive integers (like signs):

Step 1: Subtract the integers like whole numbers. Subtract smaller integer from greater integer.

98 − 71 = 27

Step 2: Write the common sign with the result. Here common sign is '+' so the difference of 98 and 71 is 27. So,

98 − 71 = 27

Note: It is not necessary to write '+' with positive integer, it's obvious.

(ii) −11 from −98

Solution: To subtract two negative integers (like signs):

Step 1: Write horizontally and change the symbol of (−) by (+).

−98 – (−11) = − 98 + 11

Step 2: Subtract smaller integer from greater integer like whole numbers

98 − 11 = 87

Step 3: Write the sign of greater integer with the result. So,

− 98 + 11= −87

(iii) 22 from −11

Solution: To subtract two integers of unlike signs:

Step 1: Add both integers like whole numbers by ignoring the sign.

11 + 22 = 33

Step 2: Write the sign of greater integer with the result. So, the difference of −11 and 22 is −33.

−11 – 22 = –33

(iv) −76 from −23

Solution: To subtract two negative integers (like signs):

Step 1: Write horizontally and change the symbol of (−) by (+).

−23 – (−76) = − 23 + 76

Step 2: Subtract smaller integer from greater integer like whole numbers

76 − 23 = 53

Step 3: Write sign of greater integer with result

− 23 + 76= 53

(v) −99 from 78

Solution: To subtract two integers of unlike signs:

Step 1: Add both integers like whole numbers by ignoring the sign.

78 + 99 = 177

Step 2: Write the sign of greater integer with the result. So, the difference of 78 and −99 is −177.

78 – (–99)= 177

(vi) −90 from −30

Solution: To subtract two negative integers (like signs):

Step 1: Write horizontally and change the symbol of (−) by (+).

−30 – (−90) = − 30 + 90

Step 2: Subtract smaller integer from greater integer like whole numbers

90 − 30 = 60

Step 3: Write the sign of greater integer with the result. So,

− 30 + 90 = 60

4. Find additive inverse of following integers.

(i) −1

Solution: To find additive inverse of an integer just change the symbol of that integer. It means:
Additive inverse of −1 is 1.

(ii) 0

Solution: Additive inverse of 0 is 0 because when we add 0 in 0 we get 0 which is the additive identity.

(iii) 45

Solution To find additive inverse of an integer just change the symbol of that integer. It means:
Additive inverse of 45 is −45.

(iv) −76

Solution: To find additive inverse of an integer just change the symbol of that integer. It means:
Additive inverse of −76 is 76.

(v) 92

Solution: To find additive inverse of an integer just change the symbol of that integer. It means:
Additive inverse of 92 is −92.

(vi) −98

Solution: To find additive inverse of an integer just change the symbol of that integer. It means:
Additive inverse of −98 is 98.

Exercise 2.3

1. Multiply the following integers.

(i) 15 × 17

Solution: Multiply both integers like multiplication of whole numbers. In result put '+' sign.

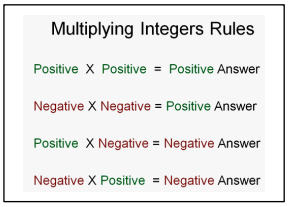
$$\begin{array}{r} 15 \\ \times\ 17 \\ \hline 105 \\ 150 \\ \hline 255 \end{array}$$

It implies: 15 × 17 = 255

(ii) −32 × 11

Solution: Multiply both integers like multiplication of whole numbers. In result put '–' sign.

$$\begin{array}{r} 32 \\ \times\ 11 \\ \hline 32 \\ 320 \\ \hline 352 \end{array}$$



It implies: −32 × 11 = −352

(iii) (−23) × (−32)

Solution Multiply both integers like multiplication of whole numbers. In result put '+' sign.

$$\begin{array}{r} 23 \\ \times\ 32 \\ \hline 46 \\ 690 \\ \hline 736 \end{array}$$

It implies: (−23) × (−32) = 736

(iv) 25 × (−4)

Solution: Multiply both integers like multiplication of whole numbers. In result put '–' sign.

$$\begin{array}{r} 25 \\ \times\ 4 \\ \hline 100 \end{array}$$

It implies: 25 × (−4) = −100

(v) −29 × 13

Solution: Multiply both integers like multiplication of whole numbers. In result put '–' sign.

$$\begin{array}{r} 29 \\ \times\ 13 \\ \hline 87 \\ 290 \\ \hline 377 \end{array}$$

It implies: −29 × 13 = −377

(vi) −105 × (−50)

Solution: Multiply both integers like multiplication of whole numbers. In result put '+' sign.

$$\begin{array}{r} 105 \\ \times\ 50 \\ \hline 000 \\ 5250 \\ \hline 5250 \end{array}$$

It implies: −105 × (−50) = 5250

2. Prove and tell the name of the law.

(i) 12 + 5 = 5 + 12

Solution: To prove this law we have to solve left-hand-side and right-hand-side separately.

LHS	**RHS**
12 + 5 = 17	5 + 12 = 17

Since both sides have the same answer, it proves the law.

The name of law is "commutative law of addition for integers".

(ii) 35 + 23 = 23 + 35

Solution: To prove this law we have to solve left-hand-side and right-hand-side separately.

LHS	**RHS**
35 + 23 = 58	23 + 35 = 58

Since both sides have the same answer, it proves the law.

The name of law is "commutative law of addition for integers".

(iii) 19 × 11 = 11 × 19

Solution: To prove this law we have to solve left-hand-side and right-hand-side separately.

LHS	**RHS**
19 × 11 = 209	11 × 19 = 209

Since both sides have the same answer, it proves the law.

The name of law is "commutative law of multiplication for integers".

(iv) 25 × 15 = 15 × 25

Solution: To prove this law we have to solve left-hand-side and right-hand-side separately.

LHS	**RHS**
25 × 15 = 375	15 × 25 = 375

Since both sides have the same answer, it proves the law.

The name of law is "commutative law of multiplication for integers".

(v) (−10 + 3) + 2 = −10 + (3 + 2)

Solution: To prove this law we have to solve left-hand-side and right-hand-side separately.

LHS	**RHS**
(−10 + 3) + 2 = (−7) + 2	−10 + (3 + 2) = −10 + 5
= −5	= −5

Since both sides have the same answer, it proves the law.

The name of law is "associative law of addition for integers".

(vi) (−7 × 3) × 2 = −7 × (3 × 2)

Solution: To prove this law we have to solve left-hand-side and right-hand-side separately.

LHS	**RHS**
(−7 × 3) × 2 = (−21) × 2	−7 × (3 × 2) = −7 × 6
= −42	= −42

Since both sides have the same answer, it proves the law.

The name of law is "associative law of multiplication for integers".

(vii) 8 × (2 + 7) = (8 × 2) + (8 × 7)

Solution: To prove this law we have to solve left-hand-side and right-hand-side separately.

LHS	**RHS**
8 × (2 + 7) = 8 × 9	(8 × 2) + (8 × 7) = (16) + (56)
= 72	= 72

Since both sides have the same answer, it proves the law.

The name of law is "distributive law of multiplication over addition for integers".

(viii) $12 \times (4 - 5) = (12 \times 4) - (12 \times 5)$

Solution: To prove this law we have to solve left-hand-side and right-hand-side separately.

LHS

$12 \times (4 - 5) = 12 \times (-1)$

$= -12$

RHS

$(12 \times 4) - (12 \times 5) = 48 - 60$

$= -12$

Since both sides have the same answer, it proves the law.

The name of law is "distributive law of multiplication over subtraction for integers".

(ix) $6 \times (-2 - 4) = (6 \times (-2)) - (6 \times 4)$

Solution: To prove this law we have to solve left-hand-side and right-hand-side separately.

LHS

$6 \times (-2 - 4) = 6 \times (-6)$

$= -36$

RHS

$(6 \times (-2)) - (6 \times 4) = (-12) - (24)$

$= -36$

Since both sides have the same answer, it proves the law.

The name of law is "distributive law of multiplication over subtraction for integers".

(x) $12 \times (5 + 3) = (12 \times 5) + (12 \times 3)$

Solution: To prove this law we have to solve left-hand-side and right-hand-side separately.

LHS

$12 \times (5 + 3) = 12 \times 8$

$= 96$

RHS

$(12 \times 5) + (12 \times 3) = (60) + (36)$

$= 96$

Since both sides have the same answer, it proves the law.

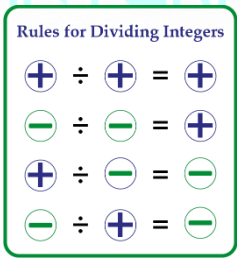
The name of law is "distributive law of multiplication over addition for integers".

3. Divide the following integers.

(i) $165 \div 15$

Solution: Divide both integers like division of whole numbers. In result put '+' sign.

$$\begin{array}{r} 11 \\ 15\overline{)165} \\ -15 \\ \hline 15 \\ -15 \\ \hline 0 \end{array}$$



It means: $165 \div 15 = 11$

(ii) $225 \div (-5)$

Solution: Divide both integers like division of whole numbers. In result put '−' sign.

$$\begin{array}{r} 45 \\ 5\overline{)225} \\ -20 \\ \hline 25 \\ -25 \\ \hline 0 \end{array}$$

It means: $225 \div (-5) = -45$

(iii) $-1044 \div (12)$

Solution: Divide both integers like division of whole numbers. In result put '−' sign.

$$\begin{array}{r} 87 \\ 12\overline{)1044} \\ -96 \\ \hline 84 \\ -84 \\ \hline 0 \end{array}$$

It means: $-1044 \div (12) = -87$

(iv) $-81 \div (-9)$

Solution: Divide both integers like division of whole numbers. In result put '+' sign.

$$\begin{array}{r} 9 \\ 9\overline{)81} \\ -81 \\ \hline 0 \end{array}$$

It means: $-81 \div (-9) = 9$

(v) **$-6240 \div 24$**

Solution: Divide both integers like division of whole numbers. In result put '−' sign.

$$
\begin{array}{r}
260 \\
24\overline{)\,6240} \\
-48 \\
\hline
144 \\
-144 \\
\hline
0
\end{array}
$$

It means: $-6240 \div 24 = -260$

(vi) **$-1886 \div (-23)$**

Solution: Divide both integers like division of whole numbers. In result put '+' sign.

$$
\begin{array}{r}
82 \\
23\overline{)\,1886} \\
-184 \\
\hline
46 \\
-46 \\
\hline
0
\end{array}
$$

It means: $-1886 \div (-23) = 82$

Review Exercise 2

1. Choose the correct option.

(i) **The numbers 1, 2, 3, 4, … are called:**

(a) prime numbers (b) negative numbers
(c) natural numbers (d) whole numbers

(ii) **The product of two whole numbers is always a:**

(a) whole number (b) natural number
(c) even number (d) odd number

(iii) **Subtraction is the reverse process of:**

(a) multiplication (b) addition
(c) subtraction (d) division

(iv) **Product of any integer with "1" is always equal to the number:**

(a) itself (b) 1 (c) 0 (d) multiplication

(v) **If two numbers having unlike signs are divided, then the sign of quotient will be:**

(a) positive (b) negative
(c) 'a' and 'b' (d) equal

(vi) **In descending order, every number is _____ the previous number.**

(a) equal to (b) less than
(c) greater than or equal to (d) less than or equal to

(vii) **In commutative law of integers over multiplication:**

(a) $c \times d = c \times d$ (b) $c + d = c + d$
(c) $c \times d = d \times c$ (d) $c + d = d + c$

(viii) **The absolute value of −11 is:**

(a) −11 (b) 11 (c) ±11 (d) both (a) and (b)

2. Arrange the following integers in ascending and descending order.

(i) **−25, −13, 13, 18, 20, 0, 11, 12**

Solution: To arrange the given integers in ascending order. Firstly, compare integers and find the smallest and the greatest integer. Secondly, compare remaining integers one by one and arrange them from the smallest to the greatest. So, Ascending order = −25, −13, 0, 11, 12, 13, 18, 20

Just change the order of integers from the greatest to the smallest.

Descending order = 20, 18, 13, 12, 11, 0, −13, −25

(ii) 110, −125, −110, 125, 325, 225, −225

Solution: To arrange the given integers in ascending order. Firstly, compare integers and find the smallest and the greatest integer. Secondly, compare remaining integers one by one and arrange them from the smallest to the greatest. So, Ascending order = −225, −125, −110, 110, 125, 225, 325

Just change the order of integers from the greatest to the smallest.

Descending order = 325, 225, 125, 110, −110, −125, −225

(iii) −18, −19, −3, −2, −20, −17, −16, −15, 0

Solution: To arrange the given integers in ascending order. Firstly, compare integers and find the smallest and the greatest integer. Secondly, compare remaining integers one by one and arrange them from the smallest to the greatest. So, Ascending order = −20, −19, −18, −17, −16, −15, −3, −2, 0

Just change the order of integers from the greatest to the smallest.

Descending order = 0, −2, −3, −15, −16, −17, −18, −19, −20

3. Arrange the absolute values of the following integers in ascending and descending order.

(i) −10, −9, 3, 2, −17, −18, −1, 0, −5

Solution: First of all, find the absolute value of each given integer.

$|-10| = 10,\ |-9| = 9,\ |3| = 3,\ |2| = 2,\ |-17| = 17,\ |-18| = 18,\ |-1| = 1,\ |0| = 0,\ |-5| = 5$

So, absolute values are 10, 9, 3, 2, 17, 18, 1, 0, 5

Now, arrange the absolute values of given integers from the smallest to the greatest (ascending order) and the greatest to the smallest (descending order).

Ascending order = 0, 1, 2, 3, 5, 9, 10, 17, 18 Descending order = 18, 17, 10, 9, 5, 3, 2, 1, 0

(ii) −225, 226, 201, 222, 122, −120, −100

Solution: First of all, find the absolute value of each given integer.

$|-225| = 225,\ |226| = 226,\ |201| = 201,\ |222| = 222,\ |122| = 122,\ |-120| = 120,\ |-100| = 100$

So, absolute values are 225, 226, 201, 222, 122, 120, 100

Now, arrange the absolute values of given integers from the smallest to the greatest (ascending order) and the greatest to the smallest (descending order).

Ascending order = 100, 120, 122, 201, 222, 225, 226 Descending order = 226, 225, 222, 201, 122, 120, 100

4. Solve the following.

(i) 57 + (−31)

Solution: To add two integers of unlike signs:

Step 1: subtract the smaller integer from the greater integer like whole numbers. Here 57 is greater than 31. it implies: 57 − 31 = 26

Step 2: Write the sign of greater integer with the result. So, 57 + (−31) = 26

(ii) 25 − (−13)

Solution: To subtract two integers of unlike signs

Step 1: Add both integers like whole numbers by ignoring the sign.

25 + 13 = 38

Step 2: Write the sign of greater integer with the result. So, the difference of 25 and −13 is 38.

So, 25 − (−13) = 38

(iii) −17 − (−11)

Solution: To subtract two negative integers (like signs)

Step 1: Write horizontally and change the symbol of (−) by (+).

−17 – (−11) = − 17 + 11

Step 2: Subtract smaller integer from greater integer like whole numbers.

17 − 11 = 6

Step 3: Write sign of greater integer with result

− 17 + 11 = − 6

(iv) −110 + (−225)

Solution: To add two integers of like signs

Step 1: Add the integers like whole numbers

110 + 225 = 335

Step 2: Write the common sign with the result. Here common sign is '−' so the sum of −110 and −225 is −335.

−110 + (−225) = −335

(v) 13 × (−25)

Solution: Multiply both integers like multiplication of whole numbers. In the result put '–' sign.

$$\begin{array}{r} 1\ 3 \\ \times 2\ 5 \\ \hline 6\ 5 \\ 2\ 6\ 0 \\ \hline 3\ 2\ 5 \end{array}$$

It means: 13 × (−25) = −325

(vi) −17 × (−10)

Solution: Multiply both integers like multiplication of whole numbers. In the result put '+' sign.

$$\begin{array}{r} 1\ 7 \\ \times 1\ 0 \\ \hline 0\ 0 \\ 1\ 7\ 0 \\ \hline 1\ 7\ 0 \end{array}$$

It means: −17 × (−10) = 170

(vii) 980 ÷ (−10)

Solution: Divide both integers same as division of whole numbers. In result put '−' sign.

$$\begin{array}{r} 9\ 8 \\ 10\overline{)\ 9\ 8\ 0} \\ -9\ 0 \\ \hline 8\ 0 \\ -8\ 0 \\ \hline 0 \end{array}$$

It means: 980 ÷ (−10) = −98

(viii) −8750 ÷ (−25)

Solution: Divide both integers same as division of whole numbers. In result put '+' sign.

$$\begin{array}{r} 3\ 5\ 0 \\ 25\overline{)\ 8\ 7\ 5\ 0} \\ -7\ 5 \\ \hline 1\ 2\ 5 \\ -1\ 2\ 5 \\ \hline 0 \end{array}$$

It means: −8750 ÷ (−25) = 350

(ix) 45 × 15

Solution: Multiply both integers like multiplication of whole numbers. In the result put '+' sign.

$$\begin{array}{r} 4\ 5 \\ \times 1\ 5 \\ \hline 2\ 2\ 5 \\ 4\ 5\ 0 \\ \hline 6\ 7\ 5 \end{array}$$

It means: 45 × 15 = 675

(x) −125 × 100

Solution: Multiply both integers like multiplication of whole numbers. In the result put '–' sign.

$$\begin{array}{r} 1\ 2\ 5 \\ \times 1\ 0\ 0 \\ \hline 0\ 0\ 0 \\ 0\ 0\ 0\ 0 \\ 1\ 2\ 5\ 0\ 0 \\ \hline 1\ 2\ 5\ 0\ 0 \end{array}$$

It means: −125 × 100 = −12500

5. Show that:

(i) 57 + 13 = 13 + 57

Solution: To prove this law we have to solve left-hand-side and right-hand-side separately.

LHS	**RHS**
57 + 13 = 70	13 + 57 = 70

Since both sides have the same answer, it proves the law.

(ii) 225 + 110 = 110 + 225

Solution: To prove this law we have to solve left-hand-side and right-hand-side separately.

LHS	**RHS**
225 + 110 = 335	110 + 225 = 335

Since both sides have the same answer, it proves the law.

(iii) 25 × 20 = 20 × 25

Solution: To prove this law we have to solve left-hand-side and right-hand-side separately.

LHS	**RHS**
25 × 20 = 500	20 × 25 = 500

Since both sides have the same answer, it proves the law.

(iv) 110 × 10 = 10 × 110

Solution: To prove this law we have to solve left-hand-side and right-hand-side separately.

LHS	**RHS**
110 × 10 = 1100	10 × 110 = 1100

Since both sides have the same answer, it proves the law.

(v) (8 + 13) + 2 = 8 + (13 + 2)

Solution: To prove this law we have to solve left-hand-side and right-hand-side separately.

LHS	**RHS**
(8 + 13) + 2 = (21) + 2	8 + (13 + 2) = 8 + 15
= 23	= 23

Since both sides have the same answer, it proves the law.

(vi) (13 × 3) × (−2) = 13 × (3 × (−2))

Solution: To prove this law we have to solve left-hand-side and right-hand-side separately.

LHS	**RHS**
(13 × 3) × (−2) = (39) × (−2)	13 × (3 × (−2)) = 13 × (−6)
= −78	= −78

Since both sides have the same answer, it proves the law.

(vii) 2 × (5 + 7) = (2 × 5) + (2 × 7)

Solution: To prove this law we have to solve left-hand-side and right-hand-side separately.

LHS	**RHS**
2 × (5 + 7) = 2 × 12	(2 × 5) + (2 × 7) = (10) + (14)
= 24	= 24

Since both sides have the same answer, it proves the law.

(viii) −3 × (10 + 3) = (−3 × 10) + (−3 × 3)

Solution: To prove this law we have to solve left-hand-side and right-hand-side separately.

LHS	**RHS**
−3 × (10 + 3) = −3 × (13)	(−3 × 10) + (−3 × 3) = −30 − 9
= −39	= −39

Since both sides have the same answer, it proves the law.

(ix) −15 × (1 − 2) = (−15 × 1) − (−15 × 2)

Solution: To prove this law we have to solve left-hand-side and right-hand-side separately.

LHS	**RHS**
−15 × (1 − 2) = −15 × (−1)	(−15 × 1) − (−15 × 2) = (−15) – (–30)
= 15	= −15 + 30
	= 15

Since both sides have the same answer, it proves the law.

(x) 21 × (−5 − 3) = (21 × (−5)) − (21 × 3)

Solution: To prove this law we have to solve left-hand-side and right-hand-side separately.

LHS	**RHS**
21 × (−5 − 3) = 21 × (−8)	(21 × (−5)) − (21 × 3) = (−105) − (63)
= −168	= −168

Since both sides have the same answer, it proves the law.