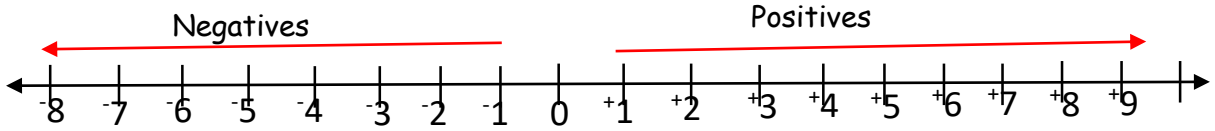
TOPIC: INTEGERS

CONTENT: Introduction and ordering integers

- An integer is a positive (+) or negative (-) number and zero.
- Examples of integers are {……$^{-}4,^{-}3,^{-}2,^{-}1,0,^{+}1,^{+}2,^{+}3,^{+}4$…….}
- Zero (0) is neither a negative (-) nor a positive integer.
- Integers can be represented on a number line.
- On a number line, positive (+) integers are put on the right hand side while negative (-) integers are put on the left as shown below



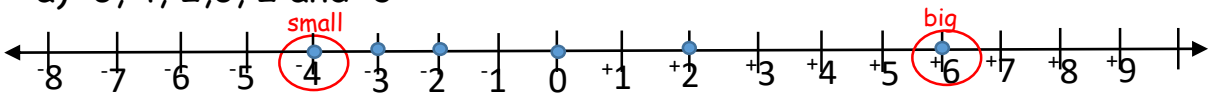
Ordering integers

Integers can be ordered in either ascending or descending order

Examples

1.Arrange the following integers in ascending order

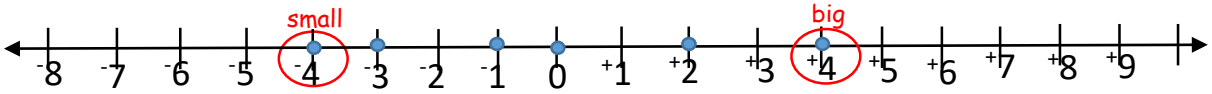
a) $^{+}6,^{-}4,^{+}2,0,^{-}2$ and $^{-}3$



Ascending order={$^{-}4,^{-}3,^{-}2,0,^{+}2,^{+}6$}

2.Arrange the following integers in descending order

a) $^{+}4,^{-}4,^{+}2,0,^{-}1$ and $^{-}3$



Descending order={$^{+}4,^{+}2,0,^{-}2,^{-}3,^{-}4$}

Activity

1.Arrange the following integers in ascending order

a) $^{+}5, ^{-}3, ^{+}3, 0, ^{-}1$ and $^{-}4$ b) $^{-}5, ^{-}2, ^{+}4, 0, ^{+}1$ and $^{-}6$

c) $^{+}6, ^{-}7, ^{+}5, 0, ^{-}4$ and $^{+}3$ d) $^{+}4, ^{-}4, ^{+}2, 0, ^{-}1$ and $^{-}3$

2.Arrange the following integers in descending order

a) $^{-}5, ^{-}3, ^{+}3, 0, ^{-}1$ and $^{+}4$ b) $^{+}7, ^{-}3, ^{+}3, 0, ^{-}1$ and $^{-}4$

c) $^{+}4, ^{-}2, ^{+}3, 0, ^{+}1$ and $^{-}1$ d) $^{+}6, ^{-}3, ^{+}3, 0, ^{-}1$ and $^{+}4$

Comparing integers using $< or > or =$

Examples

1.Compare the following integers using $< or > or =$

a) $^{-}100 < 0$ b) $^{+}67 > ^{-}67$ c) $^{-}10 > ^{-}50$

Activity

1.Compare the following integers using $< or > or =$

a) $^{-}10$... ... ...0 b) $^{+}60$... ... . $^{-}60$ c) $^{-}1$... ... ... $^{-}5$

d) $^{-}24$... ... ...$^{+}$ 24 e) $^{+}6$... ... . $^{-}30$ c) $^{-}15$ ... ... $^{-}5$

Additive inverse

Points to note

- An additive inverse is an integer which when added to another integer gives zero.
- The inverse property states that "any number added to its inverse or opposite, gives zero".
- For example; a) $^{+}4 + ^{-}4 = 0$ b) $^{-}9 + ^{+}9 = 0$

Finding additive integers

EXAMPLES

1. Find the additive inverse of $^{+}7$

   Let the inverse be k

   K+ $^{+}7$=0

   K+7-7=0-7

   K=$^{-}7$

b) Find the additive inverse of $^{-}10$

Let the inverse be r

r+ $^{-}10$=0

r-10+10=0+10

r=$^{+}10$

Activity

a) Find the additive inverse of $^{+}6$

b) Find the additive inverse of $^{-}4$

c) Find the additive inverse of $^{+}9$

d) Find the additive inverse of $^{-}5$

e)Find the additive inverse of $^{-}12$

f)Find the additive inverse of $^{+}8$

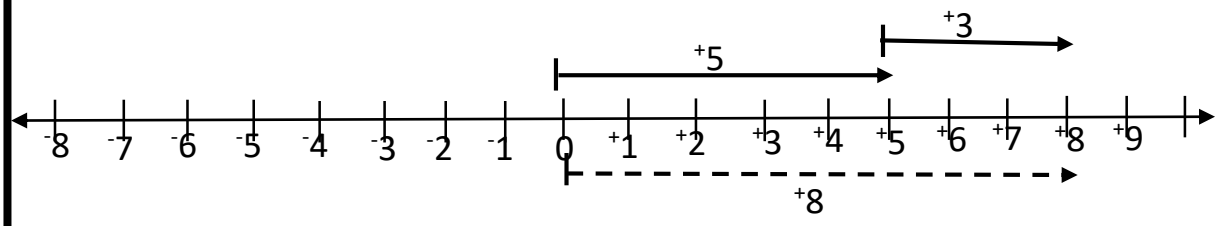
g)Find the additive inverse of $^{-}1$

h)Find the additive inverse of $^{+}11$

Addition of integers using a number line

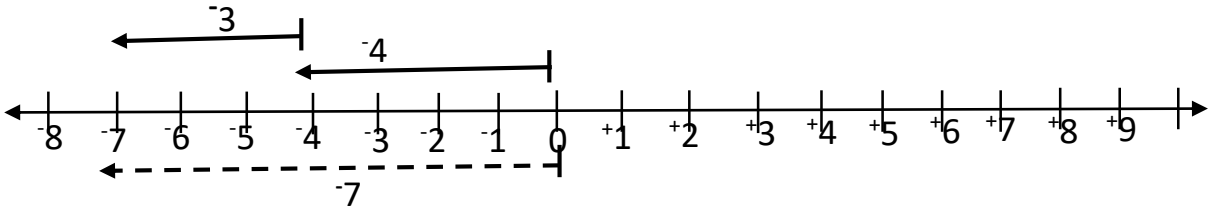
Examples

1.Add $^{+}5$ + $^{+}3$ using a number line



$^{+}5$ + $^{+}3$ =$^{+}8$

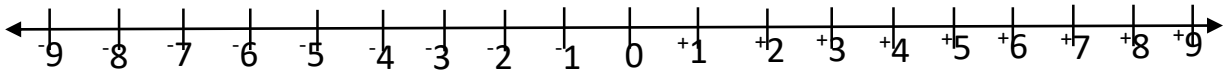
2.Add $^{-}4$ + $^{-}3$ using a number line



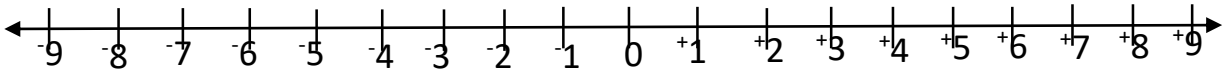
$^{-}4$ + $^{-}3$ =$^{-}7$

Activity

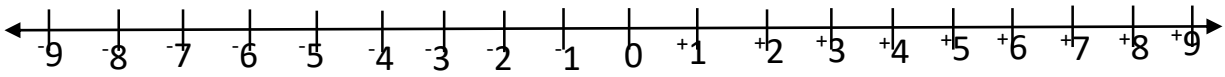
1.Add $^{-}5 + {}^{-}4$ using a number line



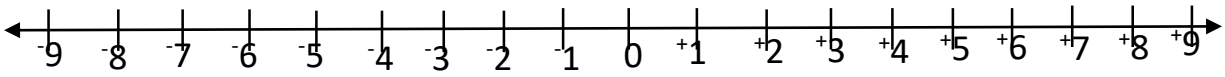
2.Add $^{+}6 + {}^{+}3$ using a number line



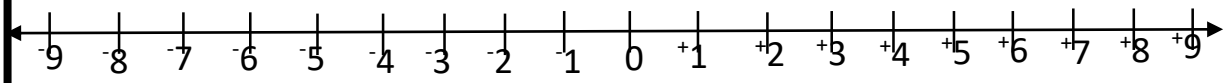
3.Add $^{-}6 + {}^{-}2$ using a number line



4.Add $^{-}3 + {}^{-}5$ using a number line



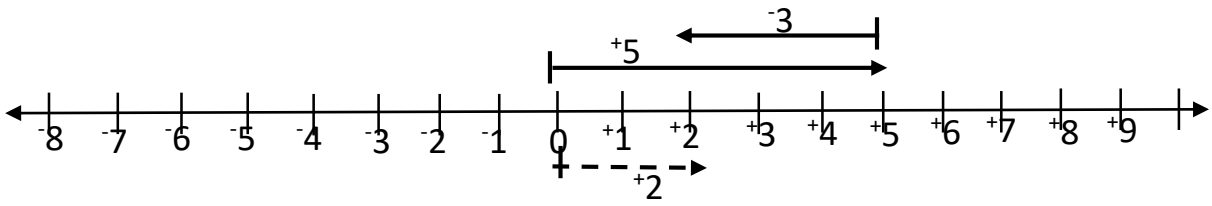
5.Add $^{+}4 + {}^{+}2$ using a number line



Addition of negative and positive integers using a number line

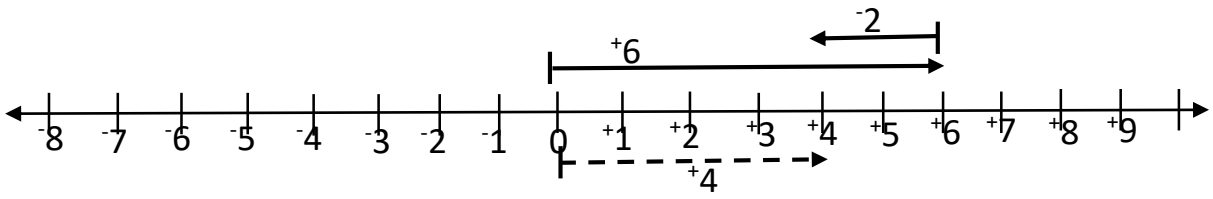
Examples

1.Add $^{+}5 + {}^{-}3$ using a number line



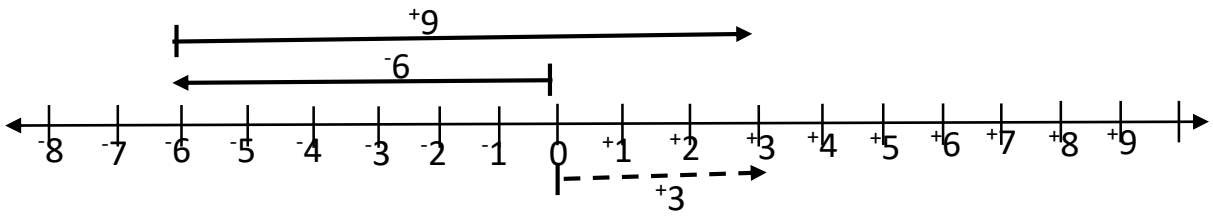
$^{+}5 + {}^{-}3 = {}^{+}2$

2.Add $^{+}6 + {}^{-}2$ using a number line



$^{+}6 + {}^{-}2 = {}^{+}4$

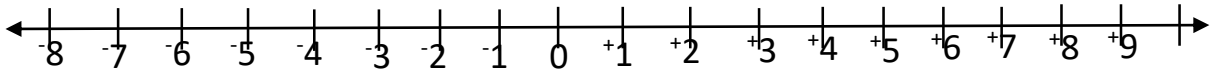
3.Add $^{-}6 + {}^{+}9$ using a number line



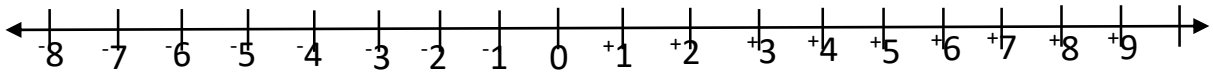
$^{-}6 + {}^{+}9 = {}^{+}3$

Activity

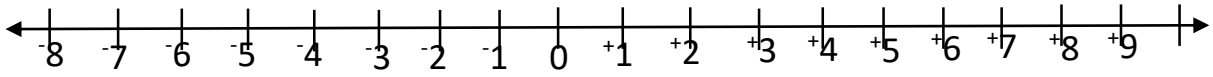
1.Add $^{+}7 + {}^{-}3$ using a number line



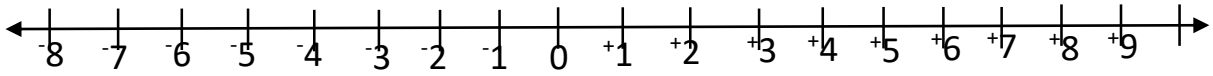
2.Add $^{+}9 + {}^{-}5$ using a number line



3.Add $^{-}8 + {}^{+}3$ using a number line



4.Add $^{-}4 + {}^{+}9$ using a number line



Addition of integers without using a number line

Points to note

- +(+)= +
- +(-)= -
- -(-)=+
- -(+)=-

Examples

1.Simplify: $^{+}6 + {}^{-}2$

$^{+}6 + (\,{}^{-}2)$

$^{+}6 - 2$

$^{+}4$

2.Simplify: $^{-}7 + {}^{+}2$

$^{-}7 + (^{+}2)$

$^{-}7 + 2$

$= {}^{-}5$

3.Simplify: $^{-}7 + {}^{-}2$

$^{-}7 + (^{-}2)$

$^{-}7 - 2$

$^{-}9$

Activity

1.Simplify: $^{+}9 + {}^{-}5$

2.Simplify: $^{+}7 + {}^{-}4$

3.Simplify: $^{+}5 + {}^{-}2$

4.Simplify: $^{-}6 + {}^{-}2$

5.Simplify: $^{-}9 + {}^{-}6$

6.Simplify: $^{+}11 + {}^{-}4$

7.Simplify: $^{+}8 + {}^{-}5$

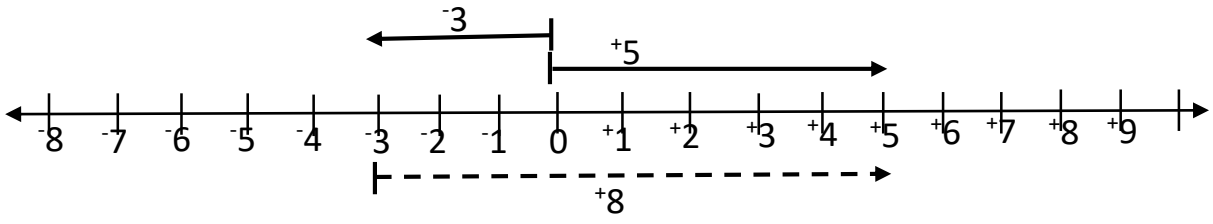
8.Simplify: $^{-}7 + {}^{-}5$

9.Simplify: $^{+}5 + {}^{-}3$

Subtraction of integers using a number line

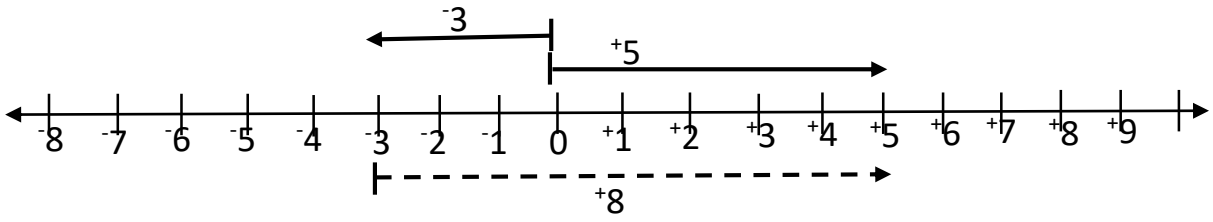
Examples

1.Subtract $^{+}5 - {}^{-}3$ using a number line



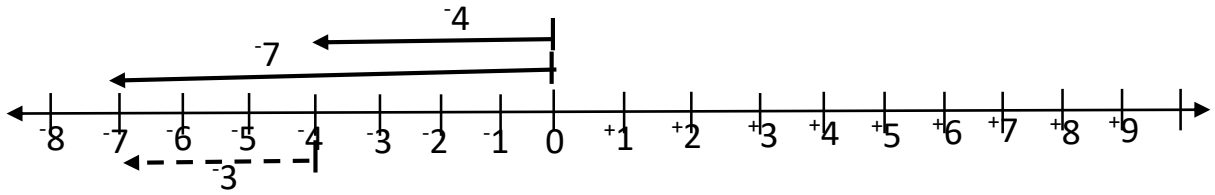
$^{+}5 - {}^{-}3 = {}^{+}8$

2. Subtract $^{+}8 - {}^{-}4$ using a number line



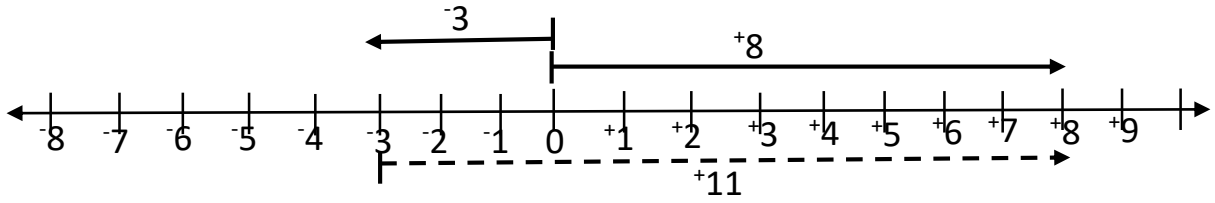
$^{+}5 - {}^{-}3 = {}^{+}8$

3.Subtract $^{-}7 - {}^{-}4$ using a number line



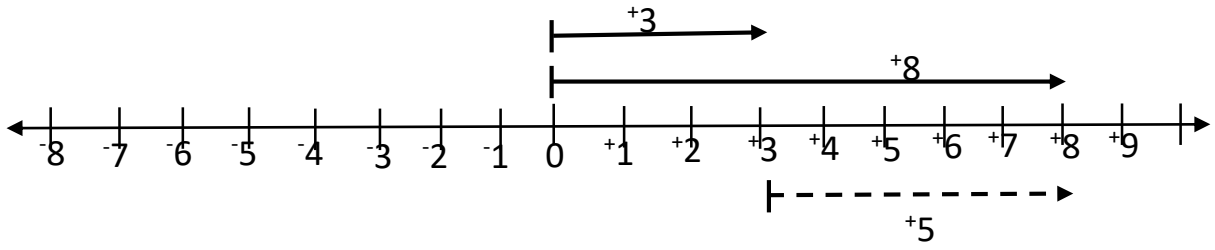
$^{-}7 - {}^{-}4 = {}^{-}3$

4.Subtract $^{+}8 - {}^{-}3$ using a number line



$^{+}8 - {}^{-}3 = {}^{+}11$

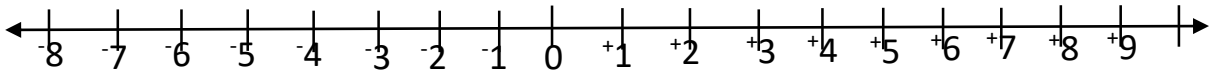
5.Subtract $^{+}8 - {}^{+}3$ using a number line



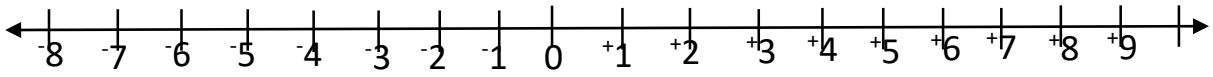
$^{+}8 - {}^{+}3 = {}^{+}5$

Activity

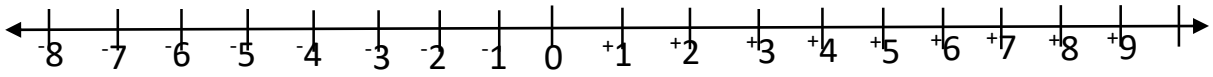
1.Subtract $^{+}5 - {}^{-}2$ using a number line



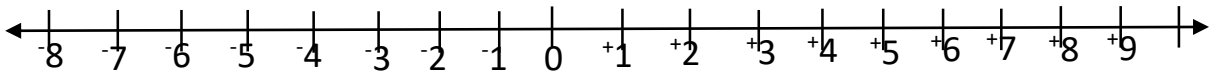
2.Subtract $^{+}7 - {}^{-}4$ using a number line



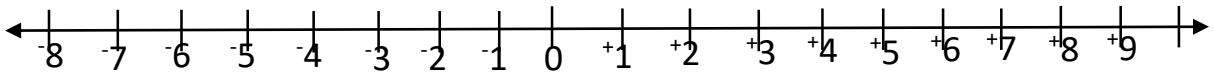
3.Subtract $^{+}5 - {}^{+}2$ using a number line



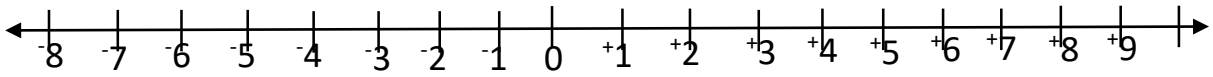
4.Subtract $^{+}7 - {}^{+}5$ using a number line



5.Subtract $^{-}6 - {}^{-}2$ using a number line



6.Subtract $^{-}8 - {}^{-}5$ using a number line



Subtraction of integers without using a number line

Points to note

- +(+)= +
- +(-)= -
- -(-)=+
- -(+)=-

Examples

1.Simplify: $^{+}6 - {}^{-}2$

$^{+}6 - (\,{}^{-}2)$

$^{+}6 + 2$

$^{+}8$

2.Simplify: $^{-}7 - {}^{+}2$

$^{-}7 - (^{+}2)$

$^{-}7 - 2$

$= {}^{-}9$

3.Simplify: $^{-}6 - {}^{-}2$

$^{-}6 - (^{-}2)$

$^{-}6 + 2$

$^{-}4$

Activity

1.Simplify: $^{+}9 - {}^{-}5$

2.Simplify: $^{+}7 - {}^{+}4$

3.Simplify: $^{+}5 - {}^{-}2$

4.Simplify: $^{-}6 - {}^{+}2$

5.Simplify: $^{-}9 - {}^{-}6$

6.Simplify: $^{+}11 - {}^{+}4$

7.Simplify: $^{+}8 - {}^{-}5$

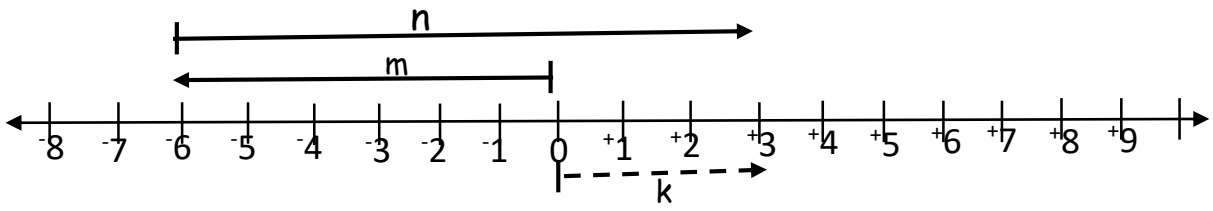
8.Simplify: $^{-}7 - {}^{+}5$

9.Simplify: $^{+}5 - {}^{-}3$

Forming addition mathematical statements from a number

EXAMPLES

Use the number line below to answer the questions that follow



a) Write down the integer represented by the arrows m,n and k

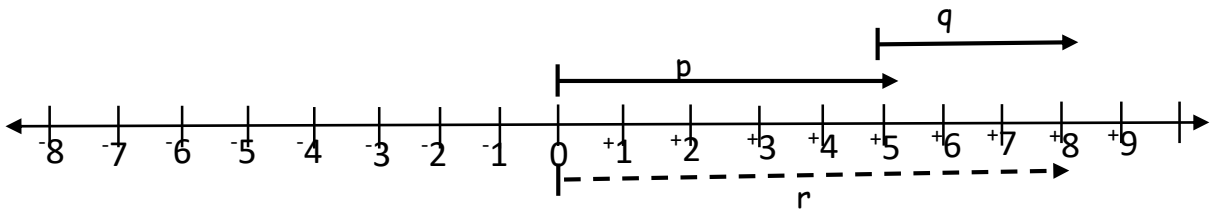
M= $^{-}6$ n= $^{+}9$ k=$^{+}3$

b)Write down the addition mathematical statement shown on the above number line

m + n = k

$^{-}6 + {}^{+}9 = {}^{+}3$

Use the number line below to answer the questions that follow



a) Write down the integer represented by the arrows p, q and r

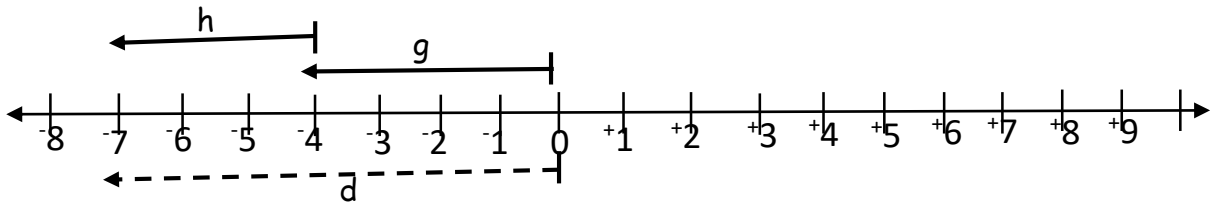
p= $^{+}5$ q= $^{+}3$ r=$^{+}8$

b) Write down the addition mathematical statement shown on the above number line

p + q = r

$^{+}5 + {}^{+}3 = {}^{+}8$

3.Use the number line below to answer the questions that follow



a) Write down the integer represented by the arrows g, h and d

g= -4 h= -3 d=-7

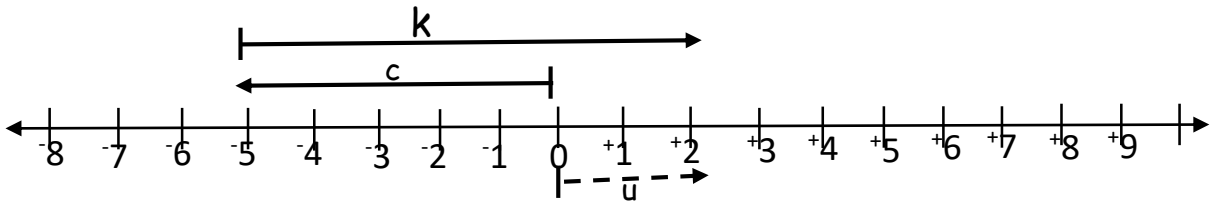
b)Write down the addition mathematical statement shown on the above number line

g + h = d

-4 + -3=-7

Activity

1. Use the number line below to answer the questions that follow

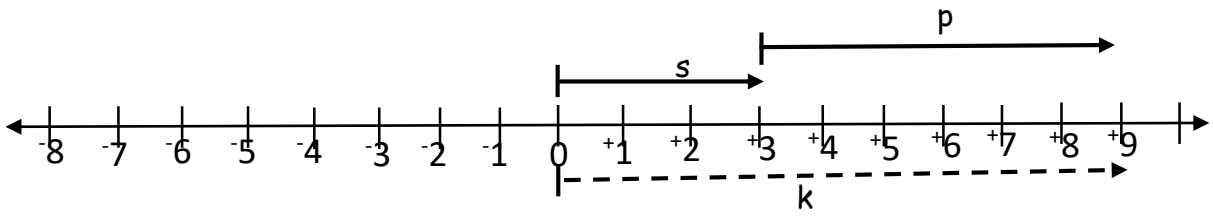


a) Write down the integer represented by the arrows c, k and u

c=…… k=…… u=……

b) Write down the addition mathematical statement shown on the above number line

Use the number line below to answer the questions that follow

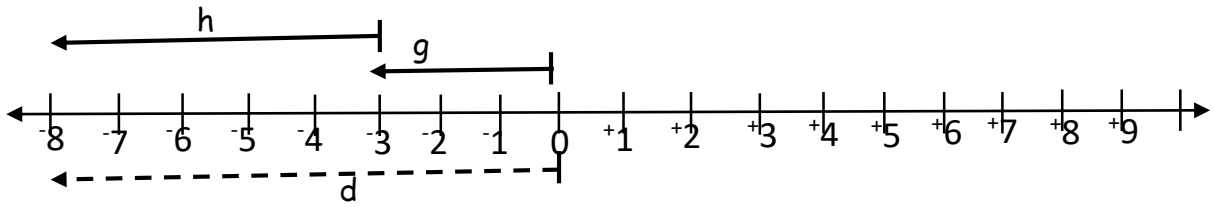


a) Write down the integer represented by the arrows p, q and r

s=…… p=…… K=……

b) Write down the addition mathematical statement shown on the above number line

3. Use the number line below to answer the questions that follow

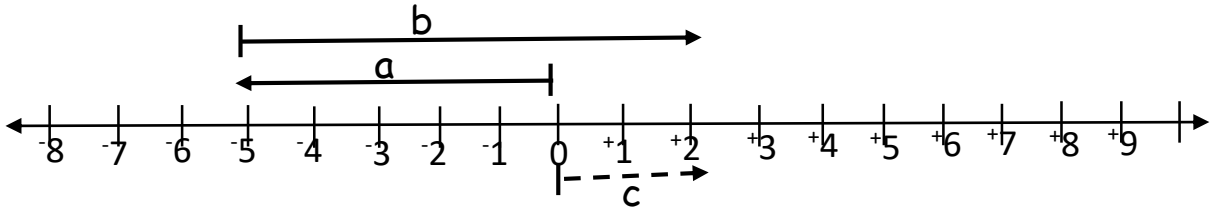


a) Write down the integer represented by the arrows g, h and d

g=…… h=…… D=……

b) Write down the addition mathematical statement shown on the above number line.

4. Use the number line below to answer the questions that follow



a) Write down the integer represented by the arrows a, b and c

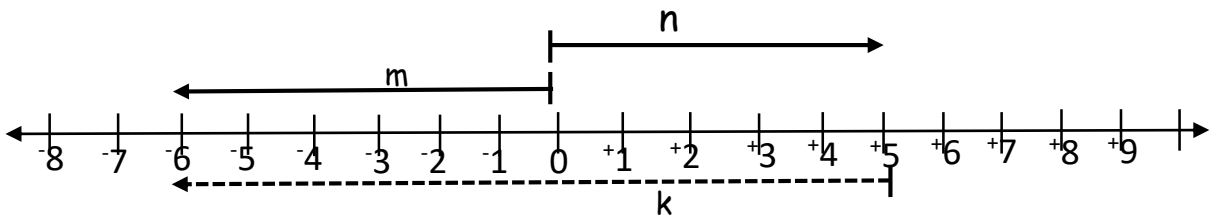
a=…… b=…… c=……

b) Write down the addition mathematical statement shown on the above number line

Forming subtraction mathematical statements from a number

EXAMPLES

Use the number line below to answer the questions that follow



b) Write down the integer represented by the arrows m,n and k

M= $^{-}6$ n= $^{+}5$ k=$^{-}11$

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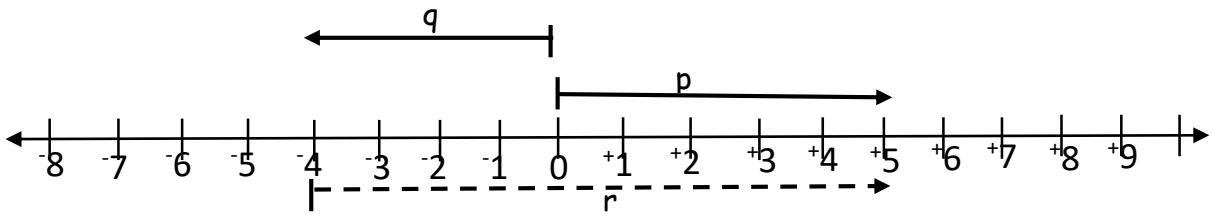
b)Write down the subtraction mathematical statement shown on the above number line

m - n = k

$^{-}6 - {}^{+}5 = {}^{-}11$

Use the number line below to answer the questions that follow



c) Write down the integer represented by the arrows p, q and r

p= $^{+}5$ q= $^{-}4$ r=$^{+}9$

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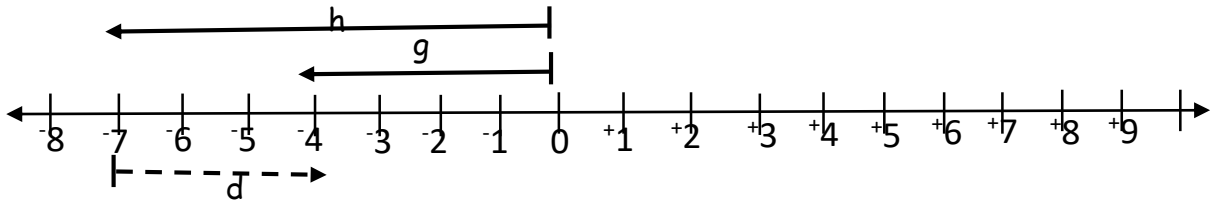
d) Write down the subtraction mathematical statement shown on the above number line

p - q = r

$^{+}5 - {}^{-}4 = {}^{+}9$

3.Use the number line below to answer the questions that follow



c) Write down the integer represented by the arrows g, h and d

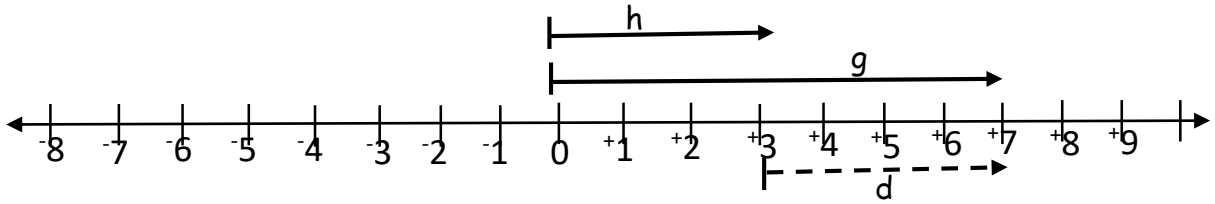
g= $^{-}$4 h= $^{-}$7 d=$^{+}$3

b)Write down the subtraction mathematical statement shown on the above number line

g - h = d

$^{-}$4 - $^{-}$7=$^{+}$3

3.Use the number line below to answer the questions that follow



d) Write down the integer represented by the arrows g, h and d

g= $^{+}$7 h= $^{+}$3 d=$^{+}$4

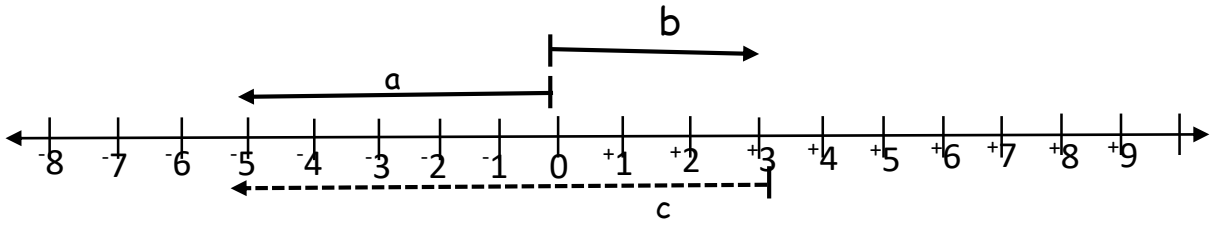
b)Write down the subtraction mathematical statement shown on the above number line

g - h = d

$^{+}$7 - $^{+}$3=$^{+}$4

Activity

1.Use the number line below to answer the questions that follow

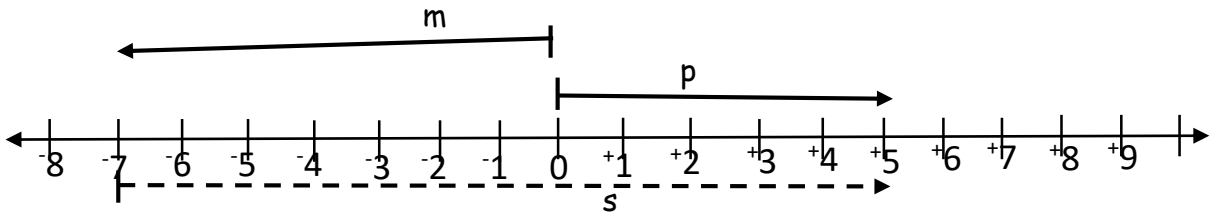


c) Write down the integer represented by the arrows a, b and c

a=---------- b=---------- c=----------

b)Write down the subtraction mathematical statement shown on the above number line

Use the number line below to answer the questions that follow

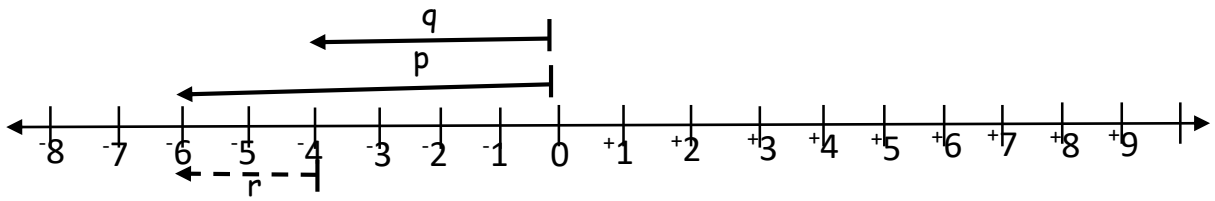


e) Write down the integer represented by the arrows m, p and s

m=---------- p=---------- s=----------

f) Write down the subtraction mathematical statement shown on the above number line

3.Use the number line below to answer the questions that follow

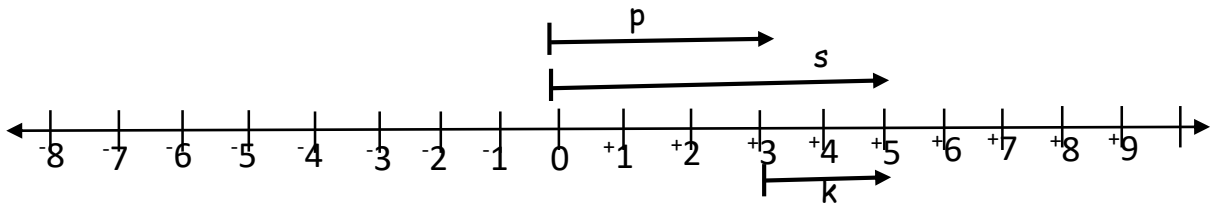


e) Write down the integer represented by the arrows p, q and r

p=---------- q=---------- r=----------

b)Write down the subtraction mathematical statement shown on the above number line

3.Use the number line below to answer the questions that follow



f) Write down the integer represented by the arrows p, s and k

p=---------- s=---------- k=----------

b)Write down the subtraction mathematical statement shown on the above number line

Multiplication of integers without using a number line

Points to note

- + x + or +(+)= +
- + x – or +(-)= -
- - x – or -(-)=+
- - x + or -(+)=-

Examples

1.Simplify: $^{+}6 \times {}^{-}2$

$^{+}6 \times {}^{-}2$

$^{-}12$

2.Simplify: $^{-}7 \times {}^{+}2$

$^{-}7x\ {}^{+}2$

$^{-}14$

3.Simplify: $^{-}6 \times {}^{-}2$

$^{-}6 \times {}^{-}2$

$^{+}12$

Activity

1.Simplify: $^{+}9 \times {}^{-}5$

2.Simplify: $^{+}7 \times {}^{+}4$

3.Simplify: $^{+}5 \times {}^{-}2$

4.Simplify: $^{-}6 \times {}^{+}2$

5.Simplify: $^{-}9 \times {}^{-}6$

6.Simplify: $^{+}11 \times {}^{+}4$

7.Simplify: $^{+}8 \times {}^{-}5$

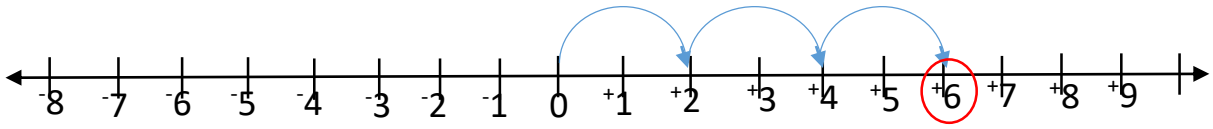
8.Simplify: $^{-}7 \times {}^{+}5$

9.Simplify: $^{-}5 \times {}^{-}3$

Multiplication of integers using a number line

Examples

1. Workout: $3 \times {}^{+}2$ using a number line
   ($^{+}3 \times {}^{+}2$ means three groups of twos)



$3 \times {}^{+}2 = {}^{+}6$

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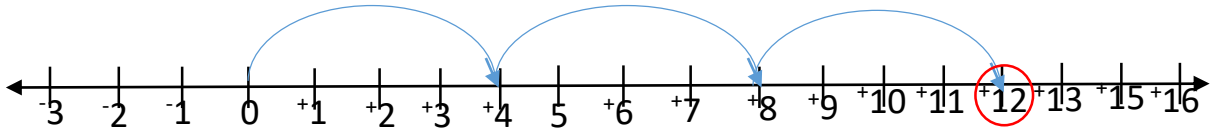
2. Workout: $3 \times {}^{+}4$ using a number line



$3 \times {}^{+}4 = {}^{+}12$

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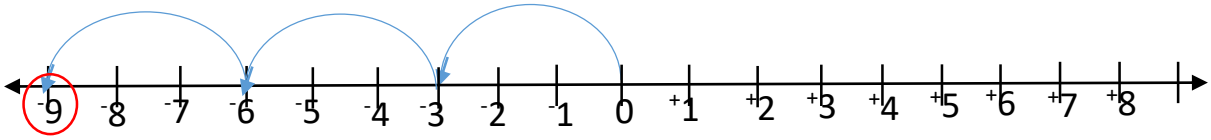
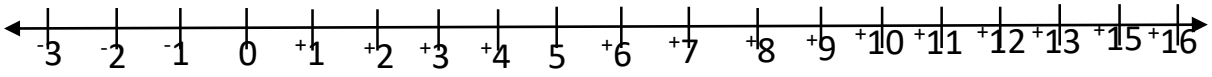
3. Workout: $3 \times {}^{-}3$ using a number line



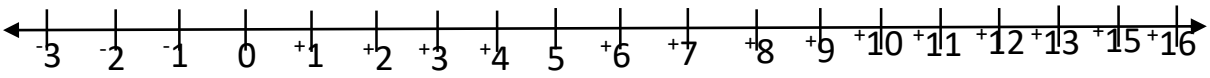
$3 \times {}^{-}3 = {}^{-}9$

Activity

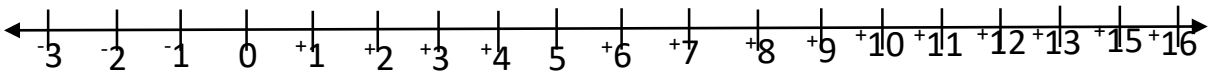
1. Workout: $2 \times {}^{+}3$ using a number line



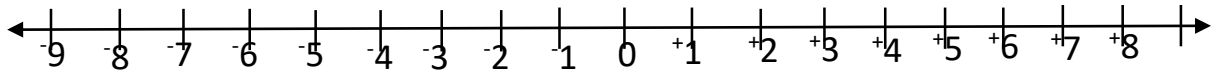
2. Workout: $3 \times {}^{+}3$ using a number line



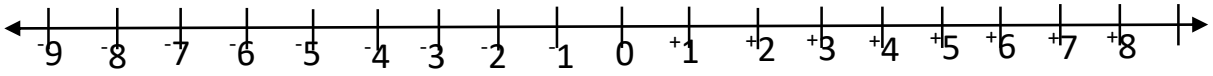
3. Workout: $4 \times {}^{+}2$ using a number line



4.Workout: $3 \times {}^{-}2$ using a number line



5.Workout: $4 \times {}^{-}2$ using a number line



Division of integers without using a number line

Points to note

- + ÷ + = +
- + ÷ − = −
- − ÷ − =+
- − ÷ + =−

Examples

1.Simplify: ${}^{+}6 \div {}^{-}2$

${}^{+}6 \div {}^{-}2$

${}^{-}3$

2.Simplify: ${}^{-}32 \div {}^{+}8$

${}^{-}32 \div {}^{+}8$

${}^{-}4$

3.Simplify: ${}^{-}16 \div {}^{-}4$

${}^{-}16 \div {}^{-}4$

${}^{+}12$

Activity

1.Simplify: ${}^{+}9 \div {}^{-}3$

2.Simplify: ${}^{+}36 \div {}^{+}4$

3.Simplify: ${}^{+}24 \div {}^{-}4$

4.Simplify: ${}^{-}6 \div {}^{+}2$

5.Simplify: ${}^{-}42 \div {}^{-}6$

6.Simplify: ${}^{+}18 \div {}^{+}2$

7.Simplify: ${}^{-}28 \div {}^{-}4$

8.Simplify: ${}^{-}35 \div {}^{+}5$

9.Simplify: ${}^{-}15 \div {}^{-}3$