

# Integers

## Ex.A

Solution 01:

**Answer :**

(i)  $15 + (-8) = 7$

(ii)  $(-16) + 9 = -7$

(iii)  $(-7) + (-23) = -30$

(iv)  $(-32) + 47 = 15$

(v)  $53 + (-26) = 27$

(vi)  $(-48) + (-36) = -84$

Solution 02:

**Answer :**

(i)  $153 + (-302) = -149$

(ii)  $1005 + (-277) = 728$

(iii)  $(-2035) + 297 = -1738$

(iv)  $(-489) + (-324) = -813$

(v)  $(-1000) + 438 = -562$

(vi)  $(-238) + 500 = 262$

Solution 03:

**Answer :**

(i) Additive inverse of  $-83 = -(-83) = 83$

(ii) Additive inverse of  $256 = -(256) = -256$

(iii) Additive inverse of  $0 = -(0) = 0$

(iv) Additive inverse of  $2001 = -(-2001) = 2001$

Solution 04:

**Answer :**

$$(i) -42 - 28 = (-42) + (-28) = -70$$

$$(ii) 42 - (-36) = 42 + 36 = 78$$

$$(iii) -53 - (-37) = (-53) - (-37) = -16$$

$$(iv) -34 - (-66) = -34 + 66 = 32$$

$$(v) 0 - 318 = -318$$

$$(vi) (-240) - (-153) = -87$$

$$(vii) 0 - (-64) = 0 + 64 = 64$$

$$(viii) 144 - (-56) = 144 + 56 = 200$$

Solution 05:

**Answer :**

$$\begin{aligned}\text{Sum of } -1032 \text{ and } 878 &= -1032 + 878 \\ &= -154\end{aligned}$$

Subtracting the sum from  $-34$ , we get

$$\begin{aligned}-34 - (-154) \\ &= (-34) + 154 \\ &= 120\end{aligned}$$

Solution 06:

**Answer :**

First, we will calculate the sum of 38 and  $-87$ .

$$38 + (-87) = -49$$

Now, subtracting  $-134$  from the sum, we get:

$$\begin{aligned}-49 - (-134) \\ &= (-49) + 134 \\ &= 85\end{aligned}$$

Solution 07:

**Answer :**

$$(i) -41 \quad (\because \text{Associative property})$$

$$(ii) -83 \quad (\because \text{Associative property})$$

$$(iii) 53 \quad (\because \text{Commutative property})$$

$$(iv) -76 \quad (\because \text{Commutative property})$$

$$(v) 0 \quad (\because \text{Additive identity})$$

$$(vi) 83 \quad (\because \text{Additive inverse})$$

$$(vii) (-60) - (-59) = -1$$

$$(viii) (-40) - (-31) = -9$$

Solution 08:

**Answer :**

$$\begin{aligned}\{-13 - (-27)\} + \{-25 - (-40)\} \\ &= \{-13 + 27\} + \{-25 + 40\} \\ &= 14 + 15 \\ &= 29\end{aligned}$$

Solution 09:

**Answer :**

$$36 - (-64) = 36 + 64 = 100$$

$$\text{Now, } (-64) - 36 = (-64) + (-36) = -100$$

$$\text{Here, } 100 \neq -100$$

Thus, they are not equal.

Solution 10:

**Answer :**

$$(a + b) + c = (-8 + (-7)) + 6 = -15 + 6 = -9$$

$$a + (b + c) = -8 + (-7 + 6) = -8 + (-1) = -9$$

Hence,  $(a + b) + c = a + (b + c)$  [i.e., Property of Associativity]

Solution 11:

**Answer :**

$$\text{Here, } (a - b) = -9 - (-6) = -3$$

$$\text{Similarly, } (b - a) = -6 - (-9) = 3$$

$$\therefore (a - b) \neq (b - a)$$

Solution 12:

**Answer :**

Let the other integer be  $a$ . Then, we have:

$$53 + a = -16$$

$$\Rightarrow a = -16 - 53 = -69$$

$\therefore$  The other integer is  $-69$ .

Solution 13:

**Answer :**

Let the other integer be  $a$ .

$$\text{Then, } -31 + a = 65$$

$$\Rightarrow a = 65 - (-31) = 96$$

$\therefore$  The other integer is  $96$ .

Solution 14:

**Answer :**

We have:

$$a - (-6) = 4$$

$$\Rightarrow a = 4 + (-6) = -2$$

$$\therefore a = -2$$

Solution 15:

**Answer :**

(i) Consider the integers 8 and  $-8$ . Then, we have:

$$8 + (-8) = 0$$

(ii) Consider the integers 2 and  $(-9)$ . Then, we have:

$$2 + (-9) = -7, \text{ which is a negative integer.}$$

(iii) Consider the integers  $-4$  and  $-5$ . Then, we have:

$$(-4) + (-5) = -9, \text{ which is smaller than } -4 \text{ and } -5.$$

(iv) Consider the integers 2 and 6. Then, we have:

$$2 + 6 = 8, \text{ which is greater than both 2 and 6.}$$

(v) Consider the integers 7 and  $-4$ . Then, we have:

$$7 + (-4) = 3, \text{ which is smaller than 7 only.}$$

Solution 16:

**Answer :**

(i) F (false).  $-3$ ,  $-90$  and  $-100$  are also integers. We cannot determine the smallest integer, since they are infinite.

(ii) F (false).  $-10$  is less than  $-7$ .

(iii) T (true). All negative integers are less than zero.

(iv) T (true).

(v) F (false). Example:  $-9 + 2 = -7$

# Integers

## Exercise 1B

Solution 01

**Answer :**

- (i)  $16 \times 9 = 144$
- (ii)  $18 \times (-6) = -(18 \times 6) = -108$
- (iii)  $36 \times (-11) = -(36 \times 11) = -396$
- (iv)  $(-28) \times 14 = -(28 \times 14) = -392$
- (v)  $(-53) \times 18 = -(53 \times 18) = -954$
- (vi)  $(-35) \times 0 = 0$
- (vii)  $0 \times (-23) = 0$
- (viii)  $(-16) \times (-12) = 192$
- (ix)  $(-105) \times (-8) = 840$
- (x)  $(-36) \times (-50) = 1800$
- (xi)  $(-28) \times (-1) = 28$
- (xii)  $25 \times (-11) = -(25 \times 11) = -275$

Solution 02

**Answer :**

- (i)  $3 \times 4 \times (-5) = (12) \times (-5) = -60$
- (ii)  $2 \times (-5) \times (-6) = (-10) \times (-6) = 60$
- (iii)  $(-5) \times (-8) \times (-3) = (-5) \times (24) = -120$
- (iv)  $(-6) \times 6 \times (-10) = 6 \times (60) = 360$
- (v)  $7 \times (-8) \times 3 = 21 \times (-8) = -168$
- (vi)  $(-7) \times (-3) \times 4 = 21 \times 4 = 84$

Solution 03

- (i) Since the number of negative integers in the product is even, the product will be positive.  
 $(4) \times (5) \times (8) \times (10) = 1600$
- (ii) Since the number of negative integers in the product is odd, the product will be negative.  
 $-(6) \times (5) \times (7) \times (2) \times (3) = -1260$
- (iii) Since the number of negative integers in the product is even, the product will be positive.  
 $(60) \times (10) \times (5) \times (1) = 3000$
- (iv) Since the number of negative integers in the product is odd, the product will be negative.  
 $-(30) \times (20) \times (5) = -3000$
- (v) Since the number of negative integers in the product is even, the product will be positive.  
 $(-3)^6 = 729$
- (vi) Since the number of negative integers in the product is odd, the product will be negative.  
 $(-5)^5 = -3125$
- (vii) Since the number of negative integers in the product is even, the product will be positive.  
 $(-1)^{200} = 1$
- (viii) Since the number of negative integers in the product is odd, the product will be negative.  
 $(-1)^{171} = -1$

Solution 04

**Answer :**

Multiplying 90 negative integers will yield a positive sign as the number of integers is even.  
 Multiplying any two or more positive integers always gives a positive integer.  
 The product of both(the above two cases) the positive and negative integers is also positive.  
 Therefore, the final product will have a positive sign.

Solution 05

Multiplying 103 negative integers will yield a negative integer, whereas 65 positive integers will give a positive integer.  
 The product of a negative integer and a positive integer is a negative integer.

Solution 06

**Answer :**

- (i)  $(-8) \times (9 + 7)$  [using the distributive law]  
 $= (-8) \times 16 = -128$
- (ii)  $9 \times (-13 + (-7))$  [using the distributive law]  
 $= 9 \times (-20) = -180$
- (iii)  $20 \times (-16 + 14)$  [using the distributive law]  
 $= 20 \times (-2) = -40$
- (iv)  $(-16) \times (-15 + (-5))$  [using the distributive law]  
 $= (-16) \times (-20) = 320$
- (v)  $(-11) \times (-15 + (-25))$  [using the distributive law]  
 $= (-11) \times (-40)$   
 $= 440$
- (vi)  $(-12) \times (10 + 5)$  [using the distributive law]  
 $= (-12) \times 15 = -180$
- (vii)  $(-16 + (-4)) \times (-8)$  [using the distributive law]  
 $= (-20) \times (-8) = 160$
- (viii)  $(-26) \times (72 + 28)$  [using the distributive law]  
 $= (-26) \times 100 = -2600$

Solution 07

**Answer :**

(i)  $(-6) \times (x) = 6$

$x = 6 \div -6 = -1$

Thus,  $x = (-1)$

(ii) 1      [ $\because$  Multiplicative identity]

(iii)  $(-8)$       [ $\because$  Commutative law]

(iv) 7      [ $\because$  Commutative law]

(v)  $(-5)$       [ $\because$  Associative law]

(vi) 0      [ $\because$  Property of zero]

Solution 08

**Answer :**

We have 5 marks for correct answer and  $(-2)$  marks for an incorrect answer.

Now, we have the following:

(i) Ravi's score =  $4 \times 5 + 6 \times (-2)$

$= 20 + (-12) = 8$

(ii) Reenu's score =  $5 \times 5 + 5 \times (-2)$

$= 25 - 10 = 15$

(iii) Heena's score =  $2 \times 5 + 5 \times (-2)$

$= 10 - 10 = 0$

Solution 09

**Answer :**

(i) True.

(ii) False. Since the number of negative signs is even, the product will be a positive integer.

(iii) True. The number of negative signs is odd.

(iv) False.  $a \times (-1) = -a$ , which is not the multiplicative inverse of  $a$ .

(v) True.  $a \times b = b \times a$

(vi) True.  $(a \times b) \times c = a \times (b \times c)$

(vii) False. Every non-zero integer  $a$  has a multiplicative inverse  $1/a$ , which is not an integer.

# Integers

## Exercise 1C

Solution 01

**Answer :**

$$(i) 65 \div (-13) = \frac{65}{-13} = -5$$

$$(ii) (-84) \div 12 = \frac{-84}{12} = -7$$

$$(iii) (-76) \div 19 = \frac{-76}{19} = -4$$

$$(iv) (-132) \div 12 = \frac{-132}{12} = -11$$

$$(v) (-150) \div 25 = \frac{-150}{25} = -6$$

$$(vi) (-72) \div (-18) = \frac{-72}{-18} = 4$$

$$(vii) (-105) \div (-21) = \frac{-105}{-21} = 5$$

$$(viii) (-36) \div (-1) = \frac{-36}{-1} = 36$$

$$(ix) 0 \div (-31) = \frac{0}{-31} = 0$$

$$(x) (-63) \div 63 = \frac{-63}{63} = -1$$

$$(xi) (-23) \div (-23) = \frac{-23}{-23} = 1$$

$$(xii) (-8) \div 1 = \frac{-8}{1} = -8$$

Solution 02



(i)

$$72 \div (x) = -4$$

$$\Rightarrow \frac{72}{x} = -4$$

$$\Rightarrow x = \frac{72}{-4} = -18$$

(ii)

$$-36 \div (x) = -4$$

$$\Rightarrow \frac{-36}{x} = -4$$

$$\Rightarrow x = \frac{-36}{-4} = 9$$

(iii)

$$(x) \div (-4) = 24$$

$$\Rightarrow \frac{x}{-4} = 24$$

$$\Rightarrow x = 24 \times (-4) = -96$$

(iv)

$$(x) \div 25 = 0$$

$$\Rightarrow \frac{x}{25} = 0$$

$$\Rightarrow x = 25 \times 0 = 0$$

(v)

$$(x) \div (-1) = 36$$

$$\Rightarrow \frac{x}{-1} = 36$$

$$\Rightarrow x = 36 \times (-1) = -36$$

(vi)

$$(x) \div 1 = -37$$

$$\Rightarrow \frac{x}{1} = -37$$

$$\Rightarrow x = -37 \times 1 = -37$$

(vii)

$$39 \div (x) = -1$$

$$\Rightarrow \frac{39}{x} = -1$$

$$\Rightarrow x = -1 \times 39 = -39$$

(viii)

$$1 \div (x) = -1$$

$$\Rightarrow \frac{1}{x} = -1$$

$$\Rightarrow x = -1 \times 1 = -1$$

(ix)

$$-1 \div (x) = -1$$

$$\Rightarrow \frac{-1}{x} = -1$$

$$\Rightarrow x = \frac{-1}{-1} = 1$$

### Solution 03

(i) True (T). Dividing zero by any integer gives zero.

(ii) False (F). Division by zero gives an indefinite number.

(iii) False (F).  $\frac{-5}{-1} = 5$

(iv) True (T).  $\frac{-8}{1} = -8$

(v) False (F).  $\frac{-1}{-1} = 1$

(vi) True (T).  $\frac{-9}{-1} = 9$

# Integers

## Exercise 1D

Solution 01

**Answer :**

(c) 14

Given:

$$\begin{aligned}6 - (-8) \\&= 6 + 8 \\&= 14\end{aligned}$$

Solution 02

**Answer :**

(b) -3

Given:

$$\begin{aligned}-9 - (-6) \\&= -9 + 6 \\&= -3\end{aligned}$$

Solution 03

**Answer :**

(d) 5

We can see that

$$-3 + 5 = 2$$

Hence, 2 exceeds -3 by 5.

Solution 04

**Answer :**

(a) 5

Let the number to be subtracted be  $x$ .

To find the number, we have:

$$\begin{aligned}-1 - x &= -6 \\ \therefore x &= -1 + 6 = 5\end{aligned}$$

Solution 05

**Answer :**

(c) 4

We can see that

$$(-2) - (-6) = (-2) + 6 = 4$$

Hence,  $-6$  is four (4) less than  $-2$ .

Solution 06

**Answer :**

(b)  $-8$

Subtracting 4 from  $-4$ , we get:

$$(-4) - 4 = -8$$

Solution 07

**Answer :**

(b) 2

$$\text{Required number} = (-3) - (-5) = 5 - 3 = 2$$

Solution 08

**Answer :**

(c) 6

$$(-3) - x = -9$$

$$\therefore x = (-3) + 9 = 6$$

Hence, 6 must be subtracted from  $-3$  to get  $-9$ .

Solution 09

**Answer :**

(c)  $-11$

Subtracting 6 from  $-5$ , we get:

$$(-5) - 6 = -11$$

Solution 10

**Answer :**

(c) 5

Subtracting  $-13$  from  $-8$ , we get:

$$(-8) - (-13)$$

$$= -8 + 13$$

$$= 5$$

Solution 11

**Answer :**

(a) 4

$$(-36) \div (-9) = 4$$

Here, the negative signs in both the numerator and denominator got cancelled with each other.

Solution 12

**Answer :**

(b) 0

Dividing zero by any integer gives zero as the result.

Solution 13

**Answer :**

(c) not defined

Dividing any integer by zero is not defined.

Solution 14

**Answer :**

(b)  $-11 < -8$

Negative integers decrease with increasing magnitudes.

Solution 15

**Answer :**

(b) 9

Let the other integer be  $a$ . Then, we have:

$$-3 + a = 6$$

$$\therefore a = 6 - (-3) = 9$$

Solution 16

**Answer :**

(a) -10

Let the other integer be  $a$ . Then, we have:

$$6 + a = -4$$

$$\therefore a = -4 - 6 = -10$$

Hence, the other integer is -10.

Solution 17

**Answer :**

(a) 22

Let the other integer be  $a$ . Then, we have:

$$-8 + a = 14$$

$$\therefore a = 14 + 8 = 22$$

Hence, the other integer is 22.

Solution 18

**Answer :**

(c) 6

The additive inverse of any integer  $a$  is  $-a$ .

Thus, the additive inverse of -6 is 6.

Solution 19

**Answer :**

(b) -150

We have  $(-15) \times 8 + (-15) \times 2$

$$= (-15) \times (8 + 2) \quad [\text{Associative property}]$$

$$= -150$$

Solution 20

**Answer :**

(b) -24

We have  $(-12) \times 6 - (-12) \times 4$

$$= (-12) \times (6 - 4) \quad [\text{Associative property}]$$

$$= -24$$

Solution 21

**Answer :**

(b) 810

$(-27) \times (-16) + (-27) \times (-14)$

$$= (-27) \times (-16 + (-14)) \quad [\text{Associative property}]$$

$$= (-27) \times (-30)$$

$$= 810$$

Solution 22

**Answer :**

(a) -270

$30 \times (-23) + 30 \times 14$

$$= 30 \times (-23 + 14) \quad [\text{Associative property}]$$

$$= 30 \times (-9)$$

$$= -270$$

Solution 23

**Answer :**

(c) 152

Let the other integer be  $a$ . Then, we have:

$$-59 + a = 93$$

$$\therefore a = 93 + 59 = 152$$

Solution 24

**Answer :**

(b) 90

$$x \div (-18) = -5$$

$$\Rightarrow \frac{x}{-18} = -5$$

$$\therefore x = -18 \times -5 = 90$$