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 :

Sum of −1032 and 878 = −1032 + 878
= -154

Subtracting the sum from −34, we get
−34 − (−154)
= (−34)+ 154
= 120

Solution 06:

Answer :

First, we will calculate the sum of 38 and −87.
38 + (−87) = −49

Now, subtracting −134 from the sum, we get:
−49 − (−134)
=(−49) + 134
= 85

Solution 07:

Answer :

(i) −41 (∵ Associative property)

(ii) −83 (∵ Associative property)

(iii) 53 (∵ Commutative property)

(iv) −76 (∵ Commutative property)

(v) 0 (∵ Additive identity)

(vi) 83 (∵ Additive inverse)

(vii) (−60) − (−59) = −1

(viii) (−40) − (−31) = −9

Solution 08:

Answer :

{−13 − (−27)} + {−25 − (−40)}
= {−13 + 27} + {−25 + 40}
=14 + 15
= 29

Solution 09:

Answer :

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

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

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 :

Here, $(a - b) = -9 - (-6) = -3$

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.
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, which is a negative integer.

(iii) Consider the integers −4 and −5. Then, we have:
(−4) + (−5) = −9, which is smaller than −4 and −5.

(iv) Consider the integers 2 and 6. Then, we have:
2 + 6 = 8, which is greater than both 2 and 6.

(v) Consider the integers 7 and −4. Then, we have:
7 + (−4) = 3, 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 × 9 = 144
(ii) 18 × (−6) = $-(18 \times 6)$ = −108
(iii) 36 × (−11) = − (36×11) = −396
(iv) (−28) ×14 = $-(28 \times 14)$ = −392
(v) (−53) × 18 = $-(53 \times 18)$ = −954
(vi) (−35) × 0 = 0
(vii) 0 × (−23) = 0
(viii) (−16) × (−12) = 192
(ix) (−105) × (−8) = 840
(x) (−36) × (−50) = 1800
(xi) (−28) × (−1) = 28
(xii) 25 × (−11) = − (25×11) = −275

Solution 02

Answer :

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

Solution 03

(i) Since the number of negative integers in the product is even, the product will be positive.
(4) × (5) × (8) × (10) = 1600
(ii) Since the number of negative integers in the product is odd, the product will be negative.
−(6) × (5) × (7) × (2) × (3) = −1260
(iii) Since the number of negative integers in the product is even, the product will be positive.
(60) × (10) × (5) × (1) = 3000
(iv) Since the number of negative integers in the product is odd, the product will be negative.
−(30) × (20) × (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) × (9 + 7) [using the distributive law]
= (−8) × 16 = −128

(ii) 9 × (−13 + (−7)) [using the distributive law]
= 9 × (−20) = −180

(iii) 20 × (−16 + 14) [using the distributive law]
= 20 × (−2) = −40

(iv) (−16) × (−15 + (−5)) [using the distributive law]
= (−16) × (−20) = 320

(v) (−11) × (−15 +(−25)) [using the distributive law]
= (−11) × (−40)
= 440

(vi) (−12) × (10 + 5) [using the distributive law]
= (−12) × 15 = −180

(vii) (−16 + (−4)) × (−8) [using the distributive law]
= (−20) × (−8) = 160

(viii) (−26) × (72 + 28) [using the distributive law]
= (−26) ×100 = −2600

Solution 07

Answer :

(i) $(-6) \times (x) = 6$
$x = 6\text{-}6 = \text{-}66 = \text{-}1$

Thus, $x = (-1)$

(ii) 1 [∵ Multiplicative identity]
(iii) (−8) [∵ Commutative law]
(iv) 7 [∵ Commutative law]
(v) (−5) [∵ Associative law]
(vi) 0 [∵ 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 1a, 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 ÷ (*x*) = −4

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

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

(ii)

−36 ÷ (*x*) = −4

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

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

(iii)

(*x*) ÷ (−4) = 24

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

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

(iv)

(*x*) ÷ 25 = 0

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

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

(v)

(*x*) ÷ (−1) = 36

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

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

(vi)

(*x*) ÷ 1 = −37

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

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

(vii)

39 ÷ (*x*) = −1

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

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

(viii)

1 ÷ (*x*) = −1

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

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

(ix)

−1 ÷ (*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:

$6 - (-8)$

$= 6 + 8$

$= 14$

Solution 02

Answer :

(b) −3

Given:

$-9 - (-6)$

$= -9 + 6$

$= -3$

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:

$-1 - x = -6$

$\therefore x = -1 + 6 = 5$

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
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 $(-15) \times 8 + (-15) \times 2$
$= (-15) \times (8 + 2)$ [Associative property]
$= -150$

Solution 20

Answer :

(b) −24
We have $(-12) \times 6 - (-12) \times 4$
$= (-12) \times (6 - 4)$ [Associative property]
$= -24$

Solution 21

Answer :

(b) 810
$(-27) \times (-16) + (-27) \times (-14)$
$= (-27) \times (-16 + (-14))$ [Associative property]
$=(-27) \times (-30)$
$= 810$

Solution 22

Answer :

(a) −270
$30 \times (-23) + 30 \times 14$
$= 30 \times (-23 + 14)$ [Associative property]
$= 30 \times (-9)$
$= -270$

Solution 23

Answer :

(c) 152

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

−59 + *a* = 93

∴ *a* = 93 + 59 = 152

Solution 24

Answer :

(b) 90

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

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

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