

Integers

Exercise 4A

Q1

Answer :

- (i) A decrease of 8
- (ii) A gain of Rs 7
- (iii) Losing a weight of 5 kg
- (iv) 10 km below the sea level
- (v) 5°C above the freezing point
- (vi) A withdrawal of Rs 100
- (vii) Spending Rs 500
- (viii) Going 6' m to the west
- (ix) The opposite of 24 is -24.
- (x) The opposite of -34 is 34.

Q2

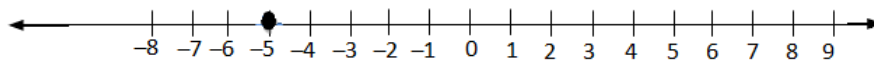
Answer :

- (i) +Rs 600
- (ii) -Rs 800
- (iii) -7°C
- (iv) -9
- (v) +2 km
- (vi) -3 km
- (vii) + Rs 200
- (viii) -Rs 300

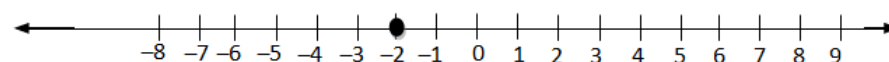
Q3

Answer :

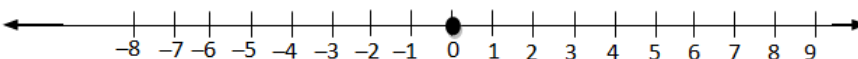
(i) -5



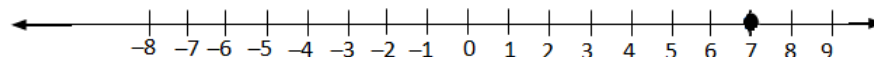
(ii) -2



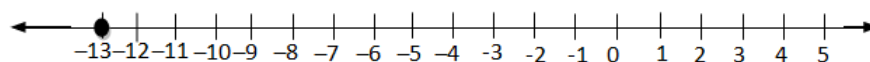
(iii) 0



(iv) 7



(v) -13



Q4

Answer :

(i) 0, -2
 $0 > -2$

This is because zero is greater than every negative integer.

(ii) -3, -5
 $-3 > -5$

Since 3 is smaller than 5, -3 is greater than -5.

(iii) -5, 2
 $2 > -5$

This is because every positive integer is greater than every negative integer.

(iv) -16, 8
 $8 > -16$

This is because every positive integer is greater than every negative integer.

v) -365, -913
 $-365 > -913$

Since 365 is smaller than 913, -365 is greater than -913.

vi) -888, 8
 $8 > -888$

This is because every positive integer is greater than every negative integer.

Q5

Answer :

i) $-7 < 6$

This is because every positive integer is greater than every negative integer.

ii) $-1 < 0$

This is because zero is greater than every negative integer.

iii) $-27 < -13$

Since 27 is greater than 13, -27 is smaller than -13.

iv) $-26 < 17$

This is because every positive integer is greater than every negative integer.

v) $-603 < -317$

Since 603 is greater than 317, -603 is smaller than -317.

vi) $-777 < 7$

This is because every positive integer is greater than every negative integer.

Q6

Answer :

i) 1, 2, 3, 4, 5

ii) -4, -3, -2, -1

iii) -2, -1, 0, 1, 2

iv) -6

Q7

Answer :

i) $0 < 7$

This is because 0 is less than any positive integer.

ii) $0 > -3$

This is because 0 is greater than any negative integer.

iii) $-5 < -2$

Since 5 is greater than 2, -5 is smaller than -2.

iv) $-15 < 13$

This is because every positive integer is greater than every negative integer.

v) $-231 < -132$

Since 231 is greater than 132, -231 is smaller than -132.

vi) $-6 < 6$

This is because every positive integer is greater than every negative integer.

Q8

Answer :

i) $-7 < -2 < 0 < 5 < 8$

ii) $-100 < -23 < -6 < -1 < 0 < 12$

iii) $-501 < -363 < -17 < 15 < 165$

iv) $-106 < -81 < -16 < -2 < 0 < 16 < 21$

Q9

Answer :

i) $36 > 7 > 0 > -3 > -9 > -132$

ii) $51 > 0 > -2 > -8 > -53$

iii) $36 > 0 > -5 > -71 > -81$

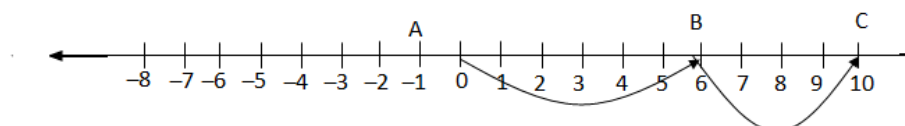
iv) $413 > 102 > -7 > -365 > -515$

Q10

Answer :

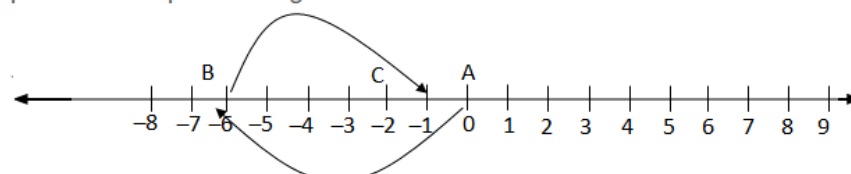
i) 4 more than 6

We want an integer that is 4 more than 6. So, we will start from 6 and proceed 4 steps to the right to obtain 10.



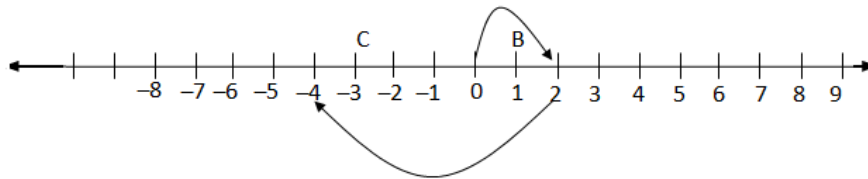
ii) 5 more than -6

We want an integer that is 5 more than -6. So, we will start from -6 and proceed 5 steps to the right to obtain -1.



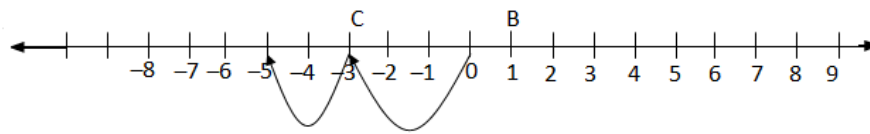
iii) 6 less than 2

We want an integer that is 6 less than 2. So, we will start from 2 and proceed 6 steps to the left to obtain -4.



iv) 2 less than -3

We want an integer that is 2 less than -3. So, we will start from -3 and proceed 2 steps to the left to obtain -5



vi) True

This is because all negative integers are to the left of 0.

vii) True

This is because natural numbers are positive and every positive integer is greater than every negative integer.

viii) False

This is because the successor of -187 is equal to -186 $(-186 + 1)$. In succession, we move from the left to the right along a number line.

ix) False

This is because the predecessor of -215 is -216 $(-216 - 1)$. To find the predecessor, we move from the right to the left along a number line.

Q12

Answer :

i) The value of $|-9|$ is 9

ii) The value of $|-36|$ is 36

iii) The value of $|0|$ is 0

iv) The value of $|15|$ is 15

v) The value of $|-3|$ is 3

$\therefore -|-3| = -3$

vi) $7 + |-3|$

$= 7 + 3$ (The value of $|-3|$ is 3)

$= 10$

vii) $|7 - 4|$

$= |3|$

$= 3$ (The value of $|3|$ is 3)

viii) $8 - |-7|$

$= 8 - 7$ (The value of $|-7|$ is 7)

$= 1$

Q13

Answer :

i) Every negative integer that is to the right of -7 is greater than -7.

So, five negative integers that are greater than -7 are -6, -5, -4, -3, -2 and -1.

ii) Every negative integer that is to the left of -20 is less than -20.

So, five negative integers that are less than -20 are -21, -22, -23, -24 and -25.

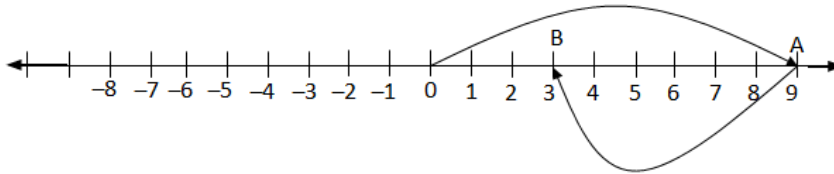
Integers

Exercise 4B

Q1

Answer :

i) On the number line, we start from 0 and move 9 steps to the right to reach a point A. Now, starting from A, we move 6 steps to the left to reach point B.



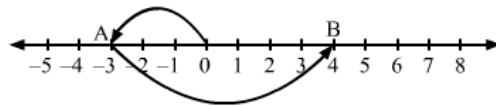
B represents the integer 3.

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

(ii) On the number line, we start from 0 and move 3 steps to the left to reach point A. Now, starting from A, we move 7 steps to the right to reach point B.

B represents the integer 4.

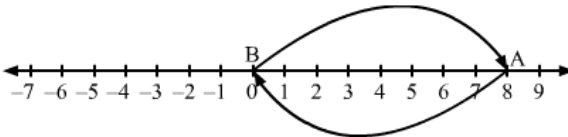
$$\therefore (-3) + 7 = 4$$



(iii) On the number line, we start from 0 and move 8 steps to the right to reach point A. Now, starting from A, we move 8 steps to the left to reach point B.

B represents the integer 0.

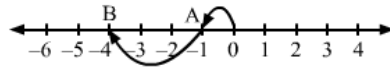
$$\therefore 8 + (-8) = 0$$



(iv) On the number line, we start from 0 and move 1 step to the left to reach point A. Now, starting from A, we move 3 steps to the left to reach point B.

B represents the integer -4.

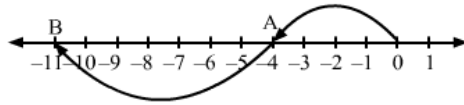
$$\therefore (-1) + (-3) = -4$$



(v) On the number line, we start from 0 and move 4 steps to the left to reach point A. Now, starting from A, we move 7 steps to the left to reach point B.

B represents the integer -11.

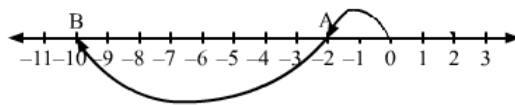
$$\therefore (-4) + (-7) = -11$$



(vi) On the number line, we start from 0 and move 2 steps to the left to reach point A. Now, starting from A, we move 8 steps to the left to reach point B.

B represents the integer -10.

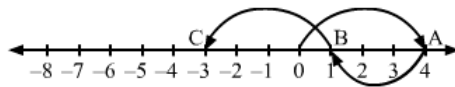
$$\therefore (-2) + (-8) = -10$$



(vii) On the number line, we start from 0 and move 3 steps to the right to reach point A. Now, starting from A, we move 2 steps to the left to reach point B. Again, starting from B, we move 4 steps to the left to reach point C.

C represents the integer -3.

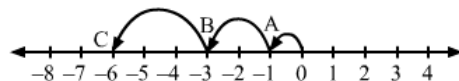
$$\therefore 3 + (-2) + (-4) = -3$$



(viii) On the number line, we start from 0 and move 1 step to the left to reach point A. Now, starting from A, we move 2 steps to the left to reach point B. Again, starting from B, we move 3 steps to the left to reach point C.

C represents the integer -6.

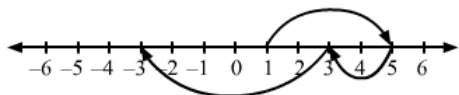
$$\therefore (-1) + (-2) + (-3) = -6$$



(ix) On the number line, we start from 0 and move 5 steps to the right to reach point A. Now, starting from A, we move 2 steps to the left to reach point B. Again, starting from B, we move 6 steps to the left to reach point C.

C represents the integer -3.

$$\therefore 5 + (-2) + (-6) = -3$$



$$\begin{aligned}
 &(\text{iv}) \\
 &(-13) + 25 \\
 &= -13 + 25 \\
 &= 12
 \end{aligned}$$

$$\begin{aligned}
 &(\text{v}) \\
 &8 + (-17) \\
 &= 8 - 17 \\
 &= -9
 \end{aligned}$$

$$\begin{aligned}
 &(\text{v}) \\
 &2 + (-12) \\
 &= 2 - 12 \\
 &= -10
 \end{aligned}$$

Q4

Answer :

$$\begin{array}{r}
 \text{i)} \\
 -206 \\
 +98 \\
 \hline
 -108
 \end{array}$$

Since we are adding a negative number with a positive number,
we shall subtract the smaller number, i.e. 98 from the greater number, i.e. 206
 $206 - 98 = 108$
 Since the greater number is negative, the sign of the result will be negative.
 So, the answer will be -108

$$\begin{array}{r}
 \text{ii)} \\
 178 \\
 -69 \\
 \hline
 109
 \end{array}$$

Since we are adding a negative number with a positive number,
we shall subtract the smaller number, i.e. 69, from the greater number, i.e. 178
 $178 - 69 = 109$
 Since the greater number is positive, the sign of the result will be positive.
 So, the answer will be 109

(iii)

$$\begin{array}{r}
 312 \\
 -103 \\
 \hline
 209
 \end{array}$$

Since we are adding a negative number with a positive number,
we shall subtract the smaller number, i.e. -103, from the greater number, i.e.
 312
 $312 - 103 = 209$
 Since the greater number is positive, the sign of the result will be positive.
 So, the answer will be 209

$$\begin{array}{r}
 (\text{iv}) \\
 -493 \\
 +289 \\
 \hline
 -204
 \end{array}$$

Since we are adding a negative number with a positive number,
we shall subtract the smaller number, i.e. 289, from the greater number, i.e.
 493.
 $493 - 289 = 204$
 Since the greater number is negative, the sign of the result will be negative.
 So, the answer will be -204

(vi) -36 and 100

$$\begin{array}{r} 100 \\ -36 \\ \hline 64 \end{array}$$

(vii) 3002 and -888

$$\begin{array}{r} 3002 \\ -888 \\ \hline 2114 \end{array}$$

(viii) -18 , $+25$ and -37

$$25 + (-18) + (-37)$$

$$= 25 - (18 + 37)$$

$$= 25 - 55$$

$$= -30$$

(ix) -312 , 39 and 192

$$39 + 192 + (-312)$$

$$= 39 + 192 - 312$$

$$= 231 - 312$$

$$= -81$$

(x) -51 , -203 , 36 and -28

$$36 + (-51) + (-203) + (-28)$$

$$= 36 - (51 + 203 + 28)$$

$$= 36 - 282$$

$$= -246$$

Q6

Answer :

(i) $-57 + 57 = 0$

So, the additive inverse of -57 is 57 .

(ii) $183 - 183 = 0$

So, the additive inverse of 183 is -183 .

(iii) $0 + 0 = 0$

So, the additive inverse of 0 is 0 .

(iv) $-1001 + 1001 = 0$

So, the additive inverse of -1001 is 1001 .

(v) $2054 - 2054 = 0$

So, the additive inverse of 2054 is -2054

Q7

Answer :

(i) The successor of 201 :

$$201 + 1 = 202$$

(ii) The successor of 70 :

$$70 + 1 = 71$$

(iii) The successor of -5 :

$$-5 + 1 = -4$$

(iv) The successor of -99 :

$$-99 + 1 = -98$$

(v) The successor of -500 :

$$-500 + 1 = -499$$

Q8

Answer :

(i) The predecessor of 120:

$$120 - 1 = 119$$

(ii) The predecessor of 79:

$$79 - 1 = 78$$

(iii) The predecessor of -8:

$$-8 - 1 = -9$$

(iv) The predecessor of -141:

$$-141 - 1 = -142$$

(v) The predecessor of -300:

$$-300 - 1 = -301$$

Q9

Answer :

(i) $(-7) + (-9) + 12 + (-16)$

$$= 12 - (7 + 9 + 16)$$

$$= 12 - 32$$

$$= -20$$

(ii) $37 + (-23) + (-65) + 9 + (-12)$

$$= 37 + 9 - (23 + 65 + 12)$$

$$= 46 - 100$$

$$= -54$$

(iii) $(-145) + 79 + (-265) + (-41) + 2$

$$= 79 + 2 - (145 + 265 + 41)$$

$$= 81 - 451$$

$$= -370$$

(iv) $1056 + (-798) + (-38) + 44 + (-1)$

$$= 1056 + 44 - (798 + 38 + 1)$$

$$= 1100 - 837$$

$$= -263$$

Q10

Answer :

Let the distance covered in the direction of north be positive and that in the direction of south be negative.

Distance travelled to the north of Patna = 60 km

Distance travelled to the south of Patna = -90 km

Total distance travelled by the car = $60 + (-90)$

$$= -30 \text{ km}$$

The car was 30 km south of Patna.

Q11

Answer :

Total cost price = Price of pencils + Price of pens

$$= 30 + 90 + 25$$

$$= \text{Rs } 145$$

Total amount sold = Price of pen + Price of pencils

$$= 20 + 70$$

$$= 90$$

Selling price - costing price = $90 - 145$

$$= -55$$

The negative sign implies loss.

Hence, his net loss was Rs 55.

Q12

Answer :

(i) True

For example: $-2 + (-1) = -3$

(ii) False

It can be negative or positive.

For example: $-2 + 3 = 1$ gives a positive integer, but $-5 + 2 = -3$ gives a negative integer.

(iii) True

For example: $100 + (-100) = 0$

(iv) False

For example: $(-5) + 2 + 3 = 0$

(v) False

$|-5| = 5$ and $|-3| = 3$, $5 > 3$

(vi) False

$|8 - 5| = 3$

$|8| + |-5| = 8 + 5$

$= 13$

$\therefore |8 - 5| \neq |8| + |-5|$

Q13

Answer :

(i) $a + 6 = 0$

$\Rightarrow a = 0 - 6$

$\Rightarrow a = -6$

(ii) $5 + a = 0$

$\Rightarrow a = 0 - 5$

(iii) $a + (-4) = 0$

$\Rightarrow a = 0 - (-4)$

$\Rightarrow a = 4$

(iv) $-8 + a = 0$

$\Rightarrow a = 0 + 8$

$\Rightarrow a = 8$

Integers

Exercise 4C

Q1

Answer :

$$\begin{aligned} \text{(i) } -34 - 18 \\ = -52 \end{aligned}$$

$$\begin{aligned} \text{(ii) } 25 - (-15) \\ = 25 + 15 \\ = 40 \end{aligned}$$

$$\begin{aligned} \text{(iii) } -28 \text{ from } -43 \\ = -43 - (-28) \\ = -43 + 28 \\ = -15 \end{aligned}$$

$$\begin{aligned} \text{(iv) } 68 \text{ from } -37 \\ = -37 - 68 \\ = -105 \end{aligned}$$

$$\begin{aligned} \text{(v) } 219 \text{ from } 0 \\ = 0 - 219 \\ = -219 \end{aligned}$$

$$\begin{aligned} \text{(vi) } -92 \text{ from } 0 \\ = 0 - (-92) \\ = 0 + 92 \\ = 92 \end{aligned}$$

$$\begin{aligned}
 & \text{(vii) } -135 \text{ from } -250 \\
 & = -250 - (-135) \\
 & = -250 + 135 \\
 & = -115
 \end{aligned}$$

$$\begin{aligned}
 & \text{(viii) } -2768 \text{ from } -287 \\
 & = -287 - (-2768) \\
 & = 2768 - 287 \\
 & = 2481
 \end{aligned}$$

$$\begin{aligned}
 & \text{(ix) } 6240 \text{ from } -271 \\
 & = -271 - (6240) \\
 & = -271 - 6240 \\
 & = -6511
 \end{aligned}$$

$$\begin{aligned}
 & \text{(x) } -3012 \text{ from } 6250 \\
 & = 6250 - (-3012) \\
 & = 6250 + 3012 \\
 & = 9262
 \end{aligned}$$

Q2

Answer :

Sum of -1050 and 813 :

$$\begin{aligned}
 & -1050 + 813 \\
 & = -237
 \end{aligned}$$

Subtracting the sum of -1050 and 813 from -23 :

$$\begin{aligned}
 & -23 - (-237) \\
 & = -23 + 237 \\
 & = 214
 \end{aligned}$$

Q3

Answer :

Sum of 138 and -250 :

$$\begin{aligned}
 & 138 + (-250) \\
 & = 138 - 250 \\
 & = -112
 \end{aligned}$$

Sum of 136 and -272 :

$$\begin{aligned}
 & = 136 + (-272) \\
 & = 136 - 272 \\
 & = -136
 \end{aligned}$$

Subtracting the sum of -250 and 138 from the sum of 136 and -272 :

$$\begin{aligned}
 & -136 - (-112) \\
 & = -136 + 112 \\
 & = -24
 \end{aligned}$$

Q4

Answer :

Adding 33 and -47 :

$$\begin{aligned}
 & 33 + (-47) \\
 & = 33 - 47 \\
 & = -14
 \end{aligned}$$

Subtracting -84 from -14 :

$$\begin{aligned}
 & -14 - (-84) \\
 & = -14 + 84 \\
 & = 70
 \end{aligned}$$

Q5

Answer :

Difference of -8 and -68 :

$$\begin{aligned} & -8 - (-68) \\ &= -8 + 68 \\ &= 60 \end{aligned}$$

Adding -36 to 60 :

$$\begin{aligned} & -36 + 60 \\ &= 24 \end{aligned}$$

Q6

Answer :

$$\begin{aligned} & \text{(i) } [37 - (-8)] + [11 - (-30)] \\ &= (37 + 8) + (11 + 30) \\ &= 45 + 41 \\ &= 86 \end{aligned}$$

$$\begin{aligned} & \text{(ii) } [-13 - (-17) + [-22 - (-40)]] \\ &= (-13 + 17) + (-22 + 40) \\ &= 4 + 18 \\ &= 22 \end{aligned}$$

Q7

Answer :

No, they are not equal.

$$\begin{aligned} & 34 - (-72) \\ &= 34 + 72 \\ &= 106 \end{aligned}$$

$$\begin{aligned} & (-72) - 34 \\ &= -72 - 34 \\ &= -106 \end{aligned}$$

Since 106 is not equal to -106 , the two expressions are not equal.

Q8

Answer :

Let the other integer be x .

According to question, we have:

$$\begin{aligned} x + 170 &= -13 \\ \Rightarrow x &= -13 - 170 \\ \Rightarrow x &= -183 \end{aligned}$$

Thus, the other integer is -183 .

Q9

Answer :

Let the other integer be x .

According to question, we have:

$$\begin{aligned} x + (-47) &= 65 \\ \Rightarrow x - 47 &= 65 \\ \Rightarrow x &= 65 + 47 \\ \Rightarrow x &= 112 \end{aligned}$$

Thus, the other integer is 112 .

Q10

Answer :

(i) True

An integer added to an integer gives an integer.

(ii) True

An integer subtracted from an integer gives an integer.

iii) False

$$-8 - (-7)$$

$$= -8 + 7$$

$$= -1$$

Since 14 is greater than 1, -1 is greater than -14 .

iv) True

$$-5 - 2 = -7$$

Since 8 is greater than 7, -7 is greater than -8 .

$$-7 > -8$$

v) False

L.H.S.

$$(-7) - 3 = -10$$

R.H.S.

$$(-3) - (-7)$$

$$= (-3) + 7$$

$$= 4$$

\therefore L.H.S. \neq R.H.S.

Q11

Answer :

Let us consider the height above the sea level as positive and that below the sea level as negative.

\therefore Height of point A from sea level = 5700 m

Depth of point B from sea level = -39600 m

Vertical distance between A and B = Distance of point A from sea level - Distance of point B from sea level

$$= 5700 - (-39600)$$

$$= 45300 \text{ m}$$

Q12

Answer :

Initial temperature of Srinagar at 6 p.m. = 1°C

Final temperature of Srinagar at midnight = -4°C

Change in temperature = Final temperature - Initial temperature

$$= (-4 - 1)^{\circ}\text{C}$$

$$= -5^{\circ}\text{C}$$

So, the temperature has changed by -5°C .

The negative sign indicates that the temperature has fallen.

So, the temperature has fallen by 5°C .

Integers

Exercise 4D

Q1

Answer :

$$\begin{aligned} \text{(i) } 15 \text{ by } 9 \\ &= 15 \times 9 \\ &= 135 \end{aligned}$$

$$\begin{aligned} \text{(ii) } 18 \text{ by } -7 \\ &= -(18 \times 7) \\ &= -126 \end{aligned}$$

$$\begin{aligned} \text{(iii) } 29 \text{ by } -11 \\ &= -(29 \times 11) \\ &= -319 \end{aligned}$$

$$\begin{aligned} \text{(iv) } -18 \text{ by } 13 \\ &= -(18 \times 13) \\ &= -234 \end{aligned}$$

$$\begin{aligned} \text{(v) } -56 \text{ by } 16 \\ &= -(56 \times 16) \\ &= -896 \end{aligned}$$

$$\begin{aligned} \text{(vi) } 32 \text{ by } -21 \\ &= -(32 \times 21) \\ &= -672 \end{aligned}$$

$$\begin{aligned} \text{(vii) } -57 \text{ by } 0 \\ &= -(57 \times 0) \\ &= 0 \end{aligned}$$

$$\begin{aligned} \text{(viii) } 0 \text{ by } -31 \\ &= -(0 \times 31) \\ &= 0 \end{aligned}$$

$$\begin{aligned}
 & \text{(ix) } -12 \text{ by } -9 \\
 & = (-12) \times (-9) \\
 & = 108
 \end{aligned}$$

$$\begin{aligned}
 & \text{(x) } (-746) \text{ by } (-8) \\
 & = (-746) \times (-8) \\
 & = 5968
 \end{aligned}$$

$$\begin{aligned}
 & \text{(xi) } 118 \text{ by } -7 \\
 & = 118 \times (-7) \\
 & = -826
 \end{aligned}$$

$$\begin{aligned}
 & \text{(xii) } -238 \text{ by } -143 \\
 & = (-238) \times (-143) \\
 & = 34034
 \end{aligned}$$

Q2

Answer :

$$\begin{aligned}
 & \text{(i) } (-2) \times 3 \times (-4) \\
 & = [(-2) \times 3] \times (-4) \\
 & = (-6) \times (-4) \\
 & = 24
 \end{aligned}$$

$$\begin{aligned}
 & \text{(ii) } 2 \times (-5) \times (-6) \\
 & = [2 \times (-5)] \times (-6) \\
 & = (-10) \times (-6) \\
 & = 60
 \end{aligned}$$

$$\begin{aligned}
 & \text{(iii) } (-8) \times 3 \times 5 \\
 & = [(-8) \times 3] \times 5 \\
 & = (-24) \times 5 \\
 & = -120
 \end{aligned}$$

$$\begin{aligned}
 & \text{(iv) } 8 \times 7 \times (-10) \\
 & = [8 \times 7] \times (-10) \\
 & = 56 \times (-10) \\
 & = -560
 \end{aligned}$$

$$\begin{aligned}
 & \text{(v) } (-3) \times (-7) \times (-6) \\
 & = [(-3) \times (-7)] \times (-6) \\
 & = 21 \times (-6) \\
 & = -126
 \end{aligned}$$

$$\begin{aligned}
 & \text{(vi) } (-8) \times (-3) \times (-9) \\
 & = [(-8) \times (-3)] \times (-9) \\
 & = 24 \times (-9) \\
 & = -216
 \end{aligned}$$

Q3

Answer :

$$\begin{aligned} \text{(i)} \quad & 18 \times (-27) \times 30 \\ & = (-27) \times [18 \times 30] \\ & = (-27) \times 540 \\ & = -14580 \end{aligned}$$

$$\begin{aligned} \text{(ii)} \quad & (-8) \times (-63) \times 9 \\ & = [(-8) \times (-63)] \times 9 \\ & = 504 \times 9 \\ & = 4536 \end{aligned}$$

$$\begin{aligned} \text{(iii)} \quad & (-17) \times (-23) \times 41 \\ & = [(-17) \times (-23)] \times 41 \\ & = 391 \times 41 \\ & = 16031 \end{aligned}$$

$$\begin{aligned} \text{(iv)} \quad & (-51) \times (-47) \times (-19) \\ & = [(-51) \times (-47)] \times (-19) \\ & = 2397 \times (-19) \\ & = -45543 \end{aligned}$$

Q4

Answer :

$$\begin{aligned} \text{(i)} \quad & \underline{\text{L.H.S.}} \\ & = 18 \times [9 + (-7)] \\ & = 18 \times [9 - 7] \\ & = 18 \times 2 \\ & = 36 \end{aligned}$$

$$\begin{aligned} & \underline{\text{R.H.S.}} \\ & = 18 \times 9 + 18 \times (-7) \\ & = 162 - (18 \times 7) \\ & = 162 - 126 \\ & = 36 \end{aligned}$$

$\therefore \text{L.H.S} = \text{R.H.S}$

Hence, verified.

$$\text{(ii)} \quad (-13) \times [(-6) + (-19)] = (-13) \times (-6) + (-13) \times (-19)$$

$$\begin{aligned} & \underline{\text{L.H.S.}} \\ & = (-13) \times [(-6) + (-19)] \\ & = (-13) \times [-6 - 19] \\ & = (-13) \times (-25) \\ & = 325 \end{aligned}$$

$$\begin{aligned} & \underline{\text{R.H.S.}} \\ & = (-13) \times (-6) + (-13) \times (-19) \\ & = 78 + 247 \\ & = 325 \end{aligned}$$

$\therefore \text{L.H.S} = \text{R.H.S}$

Hence, verified.

Q5

Answer :

\times	-3	-2	-1	0	1	2	3
-3	9	6	3	0	-3	-6	-9
-2	6	4	2	0	-2	-4	-6
-1	3	2	1	0	-1	-2	-3
0	0	0	0	0	0	0	0
1	-3	-2	-1	0	1	2	3
2	-6	-4	-2	0	2	4	6
3	-9	-6	-3	0	3	6	9

Q6

Answer :

(i) The product of a positive integer and a negative integer is negative.

True

(ii) The product of two negative integers is a negative integer.

False

The product of two negative integers is always a positive integer.

(iii) The product of three negative integers is a negative integer.

True

(iv) Every integer when multiplied by (-1) gives its multiplicative inverse.

False

Every integer when multiplied by (1) gives its multiplicative inverse.

Q7

Answer :

(i) $(-9) \times 6 + (-9) \times 4$

Solution:

Using the distributive law:

$$(-9) \times 6 + (-9) \times 4$$

$$= (-9) \times (6+4)$$

$$= (-9) \times 10$$

$$= -90$$

(ii) $8 \times (-12) + 7 \times (-12)$

Solution:

Using the distributive law:

$$8 \times (-12) + 7 \times (-12)$$

$$= (-12) \times (8+7)$$

$$= (-12) \times 15$$

$$= -180$$

$$(iii) 30 \times (-22) + 30 \times (14)$$

Solution:

Using the distributive law:

$$\begin{aligned} & 30 \times (-22) + 30 \times (14) \\ &= 30 \times [(-22) + 14] \\ &= 30 \times [-22 + 14] \\ &= 30 \times (-8) \\ &= -240 \end{aligned}$$

$$(iv) (-15) \times (-14) + (-15) \times (-6)$$

Solution:

$$(-15) \times (-14) + (-15) \times (-6)$$

Using the distributive law:

$$\begin{aligned} &= (-15) \times [(-14) + (-6)] \\ &= (-15) \times [-14 - 6] \\ &= (-15) \times (-20) \\ &= 300 \end{aligned}$$

$$(v) 43 \times (-33) + 43 \times (-17)$$

Solution:

$$43 \times (-33) + 43 \times (-17)$$

Using the distributive law:

$$\begin{aligned} &= (43) \times [-(33) + (-17)] \\ &= (43) \times [-33 - 17] \\ &= 43 \times (-50) \\ &= -2150 \end{aligned}$$

$$(vi) (-36) \times (72) + (-36) \times 28$$

Solution

$$(-36) \times (72) + (-36) \times 28$$

Using the distributive law:

$$\begin{aligned} &= (-36) \times (72 + 28) \\ &= (-36) \times 100 \\ &= -3600 \end{aligned}$$

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

Solution:

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

Using the distributive law:

$$\begin{aligned} &= (-27) \times [(-16) + (-14)] \\ &= (-27) \times [-16 - 14] \\ &= (-27) \times [-30] \\ &= 810 \end{aligned}$$

Integers

Exercise 4E

Q1

Answer :

(i) 85 by -17

$$\begin{aligned} &= \frac{-85}{17} \\ &= -5 \end{aligned}$$

(ii) -72 by 18

$$\begin{aligned} &= \frac{-72}{18} \\ &= -4 \end{aligned}$$

(iii) -80 by 16

$$\begin{aligned} &= \frac{-80}{16} \\ &= -5 \end{aligned}$$

(iv) -121 by 11

$$\begin{aligned} &= \frac{-121}{11} \\ &= -11 \end{aligned}$$

(v) 108 by -12

$$\begin{aligned} &= \frac{108}{-12} \\ &= -9 \end{aligned}$$

(vi) -161 by 23

$$\begin{aligned} &= \frac{-161}{23} \\ &= -7 \end{aligned}$$

(vii) -76 by -19

$$\begin{aligned} &= \frac{-76}{-19} \\ &= 4 \end{aligned}$$

(viii) -147 by -21

$$\begin{aligned} &= \frac{-147}{-21} \\ &= 7 \end{aligned}$$

(ix) -639 by -71

$$\begin{aligned} &= \frac{-639}{-71} \\ &= 9 \end{aligned}$$

(x) -639 by -71

$$\begin{aligned} &= \frac{-639}{-71} \\ &= 9 \end{aligned}$$

(x) -15625 by -125

$$\begin{aligned} &= \frac{-15625}{-125} \\ &= 125 \end{aligned}$$

(xi) 2067 by -1

$$\begin{aligned} &= \frac{2067}{-1} \\ &= -2067 \end{aligned}$$

(xii) 1765 by -1765

$$\begin{aligned} &= \frac{1765}{-1765} \\ &= -1 \times \frac{1765}{1765} \\ &= -1 \times 1 \\ &= -1 \end{aligned}$$

(xiii) 0 by -278

$$\begin{aligned} &= \frac{0}{-278} \\ &= 0 \end{aligned}$$

(xiv) 3000 by -100

$$\begin{aligned} &= \frac{3000}{-100} \\ &= -30 \end{aligned}$$

Q2

Answer :

- (i) $80 \div (-16) = -5$
- (ii) $(-84) \div (12) = -7$
- (iii) $(-125) \div (-5) = 25$
- (iv) $(0) \div (372) = 0$
- (v) $(-186) \div 1 = -186$
- (vi) $(-34) \div 17 = -2$
- (vii) $(-165) \div 165 = -1$
- (viii) $(-73) \div -1 = 73$
- (ix) $1 \div (-1) = -1$

Q3

Answer :

- (i) True
- (ii) False

This is because we cannot divide any integer by 0. If we do so, we get the quotient as infinity.

- (iii) True
- (iv) False

This is because the division of any two negative integers always gives a positive quotient.

- (v) True
- (vi) True
- (vii) True
- (viii) True
- (ix) False

This is because the division of any two negative integers always gives a positive quotient.

Integers

Exercise 4F

Q1

Answer :

(b) $-4 < -3$

Since 4 is greater than 3, -4 is less than -3 .

Q2

Answer :

(c) -5

2 less than -3 means the following:

$$= -3 - 2$$

$$= -5$$

Q3

Answer :

c) -1

4 more than -5 means the following:

$$= -5 + 4$$

$$= -1$$

Q4

Answer :

(a) -9

2 less than -7 means the following:

$$= -7 - 2$$

$$= -9$$

Q5

Answer :

(b) 10

$$7 + |-3|$$

$$= 7 + (+3) \text{ (The absolute value of } -3 \text{ is } 3.)$$

$$= 7 + 3$$

$$= 10$$

Q6

Answer :

(c) -77

$$(-42) + (-35)$$

$$= -42 - 35$$

$$= -77$$

Q7

Answer :

(b) -31

$$(-37) + 6$$

$$= -37 + 6$$

$$= -31$$

Q8

Answer :

(c) 22

$$49 + (-27)$$

$$= 49 - 27$$

$$= 22$$

Q9

Answer :

(c) -17

In succession, we move from the left to the right of the number line.

Q10

Answer :

(b) -17

To find the predecessor of a number, we move from the right to the left of a number line.

Q11

Answer :

(a) 5

If we add the additive inverse of a number to the number, we get 0.

$$-5 + 5 = 0$$

Q12

Answer :

(b) -7

$$-12 - (-5)$$

$$= -12 + 5$$

$$= -7$$

Q13

Answer :

(b) $13.5 - (-8)$

$$= 13.5 + 8$$

$$= 21.5$$

Q14

Answer :

(c) -55

Let x be the other integer.

$$x + 30 = -25$$

$$\Rightarrow x = -25 - 30$$

$$\Rightarrow x = -55$$

Q15

Answer :

(a) 25

Let the other integer be x

$$x + (-5) = 20$$

$$\Rightarrow x - 5 = 20$$

$$\Rightarrow x = 25$$

Q16

Answer :

(b) -21

Let the other integer be x .

$$x + 8 = -13$$

$$\Rightarrow x = -13 - 8$$

$$\Rightarrow x = -21$$

Q17

Answer :

(b) 8

$$0 - (-8)$$

$$= 0 + 8$$

$$= 8$$

Q18

Answer :

(c) 0

$$8 + (-8)$$

$$= 8 - 8$$

$$= 0$$

Q19

Answer :

(c) 1

$$(-6) + 4 - (-3)$$

$$= -6 + 4 + 3$$

$$= -6 + 7$$

$$= 1$$

Q20

Answer :

(c) 10

$$6 - (-4)$$

$$= 6 + 4$$

$$= 10$$

Q21

Answer :

$$\begin{aligned} & \text{(a) } -20 \\ & (-7) + (-9) + 12 + (-16) \\ & = -7 - 9 + 12 - 16 \\ & = -20 \end{aligned}$$

Q22

Answer :

$$\begin{aligned} & \text{(c) } -12 \\ & -4 - 8 \\ & = -12 \end{aligned}$$

Q23

Answer :

$$\text{(c) } 3$$

We have:

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

Q24

Answer :

$$\text{(c) } 15$$

We have:

$$\begin{aligned} & 10 - (-5) \\ & = 10 + 5 \\ & = 15 \end{aligned}$$

Q25

Answer :

$$\text{(b) } -54$$

We have:

$$\begin{aligned} & (-6) \times 9 \\ & = -(6 \times 9) \\ & = -54 \end{aligned}$$

Q26

Answer :

$$\text{(a) } -90$$

$$(-9) \times 6 + (-9) \times 4$$

Using distributive law:

$$\begin{aligned} & (-9) \times (6 + 4) \\ & = (-9) \times (10) \\ & = -90 \end{aligned}$$

Q27

Answer :

$$\text{(b) } -4$$

$$36 \div (-9)$$

$$36 \div 9 = 369 \times (-1) = 1(-1) \times 369 = -1 \times 4 = -4$$