Mathematics

(Chapter – 1) (Integers) (Exercise 1.1)
(Class – VII)

Question 1:

Write down a pair of integers whose:

(a) sum is -7

(b) difference is -10

(c) sum is 0

Answer 1:

(a) One such pair whose sum is -7: $-5+(-2)=-7$

(b) One such pair whose difference is -10: $-2-8=-10$

(c) One such pair whose sum is 0: $-5+5=0$

Question 2:

(a) Write a pair of negative integers whose difference gives 8.

(b) Write a negative integer and a positive integer whose is -5.

(c) Write a negative integer and a positive integer whose difference is -3.

Answer 2:

(a) $-2-(-10)-2+10=8$

(b) $(-7)+2=-5$

(c) $(-2)-1=-2-1=-3$

Question 3:

In a quiz, team A scored $-40, 10, 0$ and team B scores 10, 0, -40 in three successive rounds. Which team scored more? Can we say that we can add integers in any order?

Answer 3:

Team A scored $-40, 10, 0$

Total score of Team A = $-40+10+0=-30$

Team B scored $10, 0, -40$

Total score of Team B = $10+0+(-40)=10+0-40=-30$

Thus, scores of both teams are same.

Yes, we can add integers in any order due to commutative property.

Question 4:

Fill in the blanks to make the following statements true:

(i) $(-5)+(-8)=(-8)+(.....)$

(ii) $-53+.....=-53$

(iii) $17+.....=0$

(iv) $[13+(-12)]+(.....)=13+[(-12)+(-7)]$

(v) $(-4)+[15+(-3)]=[-4+15]+.....$

Answer 4:

(i) $(-5)+(-8)=(-8)+\underline{(-5)}$ [Commutative property]

(ii) $-53+\underline{0}=-53$ [Zero additive property]

(iii) $17+(-17)=0$ (Additive identity]

(iv) $[13+(12)]+(-7)=13+[(-12)+(-7)]$ [Associative property]

(v) $(-4)+[15+(-3)]=[-4+15]+(-3)$ [Associative property]

Mathematics

(Chapter – 1) (Integers) (Exercise 1.2)
(Class – VII)

Question 1:

Find the each of the following products:

(a) $3 \times (-1)$
(b) $(-1) \times 225$
(c) $(-21) \times (-30)$
(d) $(-316) \times (-1)$
(e) $(-15) \times 0 \times (-18)$
(f) $(-12) \times (-11) \times (10)$
(g) $9 \times (-3) \times (-6)$
(h) $(-18) \times (-5) \times (-4)$
(i) $(-1) \times (-2) \times (-3) \times 4$
(j) $(-3) \times (-6) \times (2) \times (-1)$

Answer 1:

(a) $3 \times (-1) = -3$
(b) $(-1) \times 225 = -225$
(c) $(-21) \times (-30) = 630$
(d) $(-316) \times (-1) = 316$
(e) $(-15) \times 0 \times (-18) = 0$
(f) $(-12) \times (-11) \times (10) = 132 \times 10 = 1320$
(g) $9 \times (-3) \times (-6) = 9 \times 18 = 162$
(h) $(-18) \times (-5) \times (-4) = 90 \times (-4) = -360$
(i) $(-1) \times (-2) \times (-3) \times 4 = (-6 \times 4) = -24$
(j) $(-3) \times (-6) \times (2) \times (-1) = (-18) \times (-2) = 36$

Question 2:

Verify the following:

(a) $18 \times [7 + (-3)] = [18 \times 7] + [18 \times (-3)]$
(b) $(-21) \times [(-4) + (-6)] = [(-21) \times (-4)] + [(-21) \times (-6)]$

Answer 2:

(a) $18 \times [7 + (-3)] = [18 \times 7] + [18 \times (-3)]$

$\Rightarrow 18 \times 4 = 126 + (-54)$
$\Rightarrow 72 = 72$
$\Rightarrow$ L.H.S. = R.H.S.
Hence, verified.

(b) $(-21) \times [(-4) + (-6)] = [(-21) \times (-4)] + [(-21) \times (-6)]$

$\Rightarrow (-21) \times (-10) = 84 + 126$
$\Rightarrow 210 = 210$
$\Rightarrow$ L.H.S. = R.H.S.
Hence, verified.

Question 3:

(i) For any integer a, what is $(-1) \times a$ equal to?

(ii) Determine the integer whose product with (-1) is:

(a) –22 (b) 37 (c) 0

Answer 3:

(i) $(-1) \times a = -a$, where a is an integer.

(ii) (a) $(-1) \times (-22) = 22$ (b) $(-1) \times 37 = -37$ (c) $(-1) \times 0 = 0$

Question 4:

Starting from $(-1)\times 5$, write various products showing some patterns to show $(-1)\times(-1)=1$.

Answer 4:

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

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

$(-1)\times 3=-3$

$(-1)\times 2=-2$

$(-1)\times 1=-1$

$(-1)\times 0=0$

$(-1)\times(-1)=1$

Thus, we can conclude that this pattern shows the product of one negative integer and one positive integer is negative integer whereas the product of two negative integers is a positive integer.

Mathematics

(Chapter – 1) (Integers) (Exercise 1.3)
(Class – VII)

Question 1:

Evaluate each of the following:

(a) $(-30)\div 10$

(b) $50\div(-5)$

(c) $(-36)\div(-9)$

(d) $(-49)\div 49$

(e) $13\div[(-2)+1]$

(f) $0\div(-12)$

(g) $(-31)\div[(-30)\div(-1)]$

(h) $[(-36)\div 12]\div 3$

(i) $[(-6)+5]\div[(-2)+1]$

Answer 1:

(a) $(-30)\div 10 = (-30)\times\frac{1}{10}=\frac{-30\times 1}{10}=-3$

(b) $50\div(-5) = 50\times\left(\frac{-1}{5}\right)=\frac{50\times(-1)}{5}=-10$

(c) $(-36)\div(-9) = (-36)\times\left(\frac{-1}{9}\right)=\frac{(-36)\times(-1)}{9}=\frac{36}{9}=4$

(d) $(-49)\div 49 = (-49)\times\frac{1}{49}=\frac{-49}{49}=-1$

(e)) $13\div[(-2)+1] = 13\div(-1)=13\times\left(\frac{-1}{1}\right)=-13$

(f) $0\div(-12) = 0\times\left(\frac{-1}{12}\right)=\frac{0}{12}=0$

(g) $(-31)\div[(-30)\div(-1)] = (-31)\div(-30-1)=(-31)\div(-31)=(-31)\times\left(\frac{-1}{31}\right)=\frac{31}{31}=1$

(h) $[(-36)\div 12]\div 3 = \left[(-36)\times\frac{1}{12}\right]\times\frac{1}{3}=\left(\frac{-36}{12}\right)\times\frac{1}{3}=(-3)\times\frac{1}{3}=\frac{-3}{3}=-1$

(i) $[(-6)+5]\div[(-2)+1] = (-6+5)\div(-2+1)=(-1)\div(-1)=(-1)\times\frac{(-1)}{1}=1$

Question 2:

Verify that $a \div (b+c) \neq (a \div b)+(a \div c)$ for each of the following values of a, b and c.

(a) $a=12, b=-4, c=2$ **(b)** $a=(-10), b=1, c=1$

Answer 2:

(a) Given: $a \div (b+c) \neq (a \div b)+(a \div c)$

$a=12, b=-4, c=2$

Putting the given values in L.H.S. = $12 \div (-4+2) = 12 \div (-2) = 12 \div \left(\frac{-1}{2}\right) = \frac{-12}{2} = -6$

Putting the given values in R.H.S. = $\left[12 \div (-4)\right]+(12 \div 2) = \left(12 \times \frac{-1}{4}\right)+6 = -3+6 = 3$

Since, L.H.S. ≠ R.H.S.
Hence verified.

(b) Given: $a \div (b+c) \neq (a \div b)+(a \div c)$

$a=-10, b=1, c=1$

Putting the given values in L.H.S. = $-10 \div (1+1) = -10 \div (2) = -5$

Putting the given values in R.H.S. = $[-10 \div 1]+(-10 \div 1) = -10-10 = -20$

Since, L.H.S. ≠ R.H.S.
Hence verified.

Question 3:

Fill in the blanks:

(a) $369 \div \_\_\_\_\_ = 369$

(b) $(-75) \div \_\_\_\_\_ = (-1)$

(c) $(-206) \div \_\_\_\_\_ = 1$

(d) $(-87) \div \_\_\_\_\_ = 87$

(e) $\_\_\_\_\_ \div 1 = -87$

(f) $\_\_\_\_\_ \div 48 = -1$

(g) $20 \div \_\_\_\_\_ = -2$

(h) $\_\_\_\_\_ \div (4) = -3$

Answer 3:

(a) $369 \div \underline{1} = 369$

(b) $(-75) \div \underline{75} = (-1)$

(c) $(-206) \div \underline{(-206)} = 1$

(d) $(-87) \div \underline{(-1)} = 87$

(e) $\underline{(-87)} \div 1 = -87$

(f) $\underline{(-48)} \div 48 = -1$

(g) $20 \div \underline{(-10)} = -2$

(h) ($\underline{(-12)} \div (4) = -3$

Question 4:

Write five pairs of integers (a,b) such that $a \div b = -3$. One such pair is $(6,-2)$ because $6 \div (-2) = (-3)$.

Answer 4:

(i) $(-6) \div 2 = -3$

(ii) $9 \div (-3) = -3$

(iii) $12 \div (-4) = -3$

(iv) $(-9) \div 3 = -3$

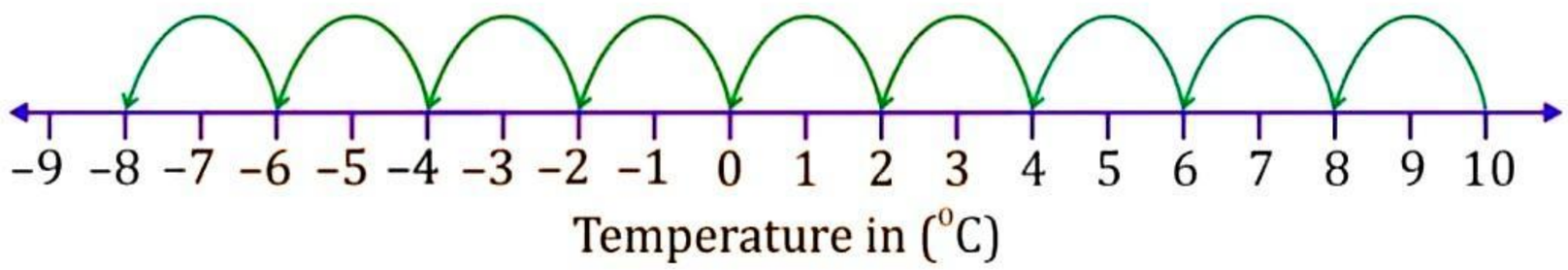
(v) $(-15) \div 5 = -3$

Question 5:

The temperature at 12 noon was 10^oC above zero. If it decreases at the rate of 2^oC per hour until mid-night, at what time would the temperature be 8^oC below zero? What would be the temperature at mid-night?

Answer 5:

Following number line is representing the temperature:



The temperature decreases 2^oC = 1 hour

The temperature decreases $1^oC = \frac{1}{2}$ hour

The temperature decreases $18^oC = \frac{1}{2} \times 18 = 9$ hours

Total time = 12 noon + 9 hours = 21 hours = 9 pm

Thus, at 9 pm the temperature would be 8^oC below 0^oC.

Question 6:

In a class test (+3) marks are given for every correct answer and (-2) marks are given for every incorrect answer and no marks for not attempting any question.

(i) Radhika scored 20 marks. If she has got 12 correct answers, how many questions has she attempted incorrectly?

(ii) Mohini scores (-5) marks in this test, though she has got 7 correct answers. How many questions has she attempted incorrectly?

Answer 6:

(i) Marks given for one correct answer = 3

Marks given for 12 correct answers = 3 x 12 = 36

Radhika scored 20 marks.

Therefore, Marks obtained for incorrect answers = 20 – 36 = –16

Now, marks given for one incorrect answer = –2

Therefore, number of incorrect answers = $(-16) \div (-2) = 8$

Thus, Radhika has attempted 8 incorrect questions.

(ii) Marks given for seven correct answers = 3 x 7 = 21

Mohini scores = –5

Marks obtained for incorrect answers = –5 – 21 = –26

Now, marks given for one incorrect answer = –2

Therefore, number of incorrect answers = $(-26)\div(-2)=13$

Thus, Mohini has attempted 13 incorrect questions.

Question 7:

An elevator descends into a mine shaft at the rate of 6 m/min. If the descent starts from 10 above the ground level, how long will it take to reach -350 m.

Answer 7:

Starting position of mine shaft is 10 m above the ground but it moves in opposite direction so it travels the distance (–350) m below the ground.

So total distance covered by mine shaft = 10 m – (–350) m = 10 + 350 = 360 m

Now, time taken to cover a distance of 6 m by it = 1 minute

So, time taken to cover a distance of 1 m by it = $\frac{1}{6}$ minute

Therefore, time taken to cover a distance of 360 m = $\frac{1}{6}\times 360$

= 60 minutes = 1 hour

(Since 60 minutes = 1 hour)

Thus, in one hour the mine shaft reaches –350 below the ground.