Integers: Exercise 1.4

Q.1 Evaluate each of the following:

(a) (−30) ÷ 10 **(b) 50 ÷ (−5)**
(c) (−36) ÷ (−9) **(d) (− 49) ÷ (49)**
(e) 13 ÷ [(−2) + 1] **(f) 0 ÷ (−12)**
(g) (−31) ÷ [(−30) + (−1)] **(h) [(−36) ÷ 12] ÷ 3**
(i) [(− 6) + 5)] ÷ [(−2) + 1]

Sol: Evaluation:

(a) Given: (−30) ÷ 10 = -3

(b) Given: 50 ÷ (−5) = -10

(c) Given: (−36) ÷ (−9) = 4

(d) Given: (− 49) ÷ (49) = -1

(e) Given: 13 ÷ [(−2) + 1] = 13 ÷ (-1)
= -13

(f) Given: 0 ÷ (−12) = 0

(g) Given: (−31) ÷ [(−30) + (−1)] = (-31) ÷ (-31)
= 1

(h) Given: [(−36) ÷ 12] ÷ 3
Firstly we will solve the bracket,
[(−36) ÷ 12] ÷ 3 = [-3] ÷ 3
= -1

(i) Given: [(− 6) + 5)] ÷ [(−2) + 1] = [-1] ÷ [-1]
= 1

Q.2 Verify that a ÷ (b + c) ≠ (a ÷ b) + (a ÷ 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**

Sol: Verification of expression: a ÷ (b + c) ≠ (a ÷ b) + (a ÷ c)

(a) Given: a = 12, b = − 4, c = 2
By taking LHS, a ÷ (b + c)
Putting the value of a, b and c,
12 ÷ {(-4) + 2} = 12 ÷ (-2)
= -6
Now taking RHS, (a ÷ b) + (a ÷ c)
(12) ÷ (-4) + (12 ÷ 2) = -3 + 6
= 3
From above calculation, LHS ≠ RHS
Thus, given expression: a ÷ (b + c) ≠ (a ÷ b) + (a ÷ c) has been verified.

(b) Given: a = (−10), b = 1, c = 1
By taking LHS, a ÷ (b + c)
Putting the value of a, b and c,
(-10) ÷ {1 + 1} = -10 ÷ (2)
= -5
Now taking RHS, (a ÷ b) + (a ÷ c)
[(-10) ÷ (1)] + [(-10) ÷ 1] = -10 -10
= -20
From above calculation, LHS ≠ RHS
Thus, given expression: a ÷ (b + c) ≠ (a ÷ b) + (a ÷ c) has been verified.

Q.3 Fill in the blanks:

(a) 369 ÷ _____ = 369

(b) (−75) ÷ _____ = −1

(c) (−206) ÷ _____ = 1

(d) − 87 ÷ _____ = 87

(e) _____ ÷ 1 = − 87

(f) _____ ÷ 48 = −1

(g) 20 ÷ _____ = −2

(h) _____ ÷ (4) = −3

Sol:

(a) Given: 369 ÷ _____ = 369

Let x be the missing integer,

$369 \div (x) = 369$

$x = (369/369)$

$x = 1$

Thus, 369 ÷ **(1)** = 369

(b) Given: (−75) ÷ _____ = −1

Let x be the missing integer,

$(-75) \div (x) = -1$

$x = (-75/-1)$

$x = 75$

Thus, (−75) ÷ **(75)** = −1

(c) Given: (−206) ÷ _____ = 1

Let x be the missing integer,

$(-206) \div (x) = 1$

$x = (-206/1)$

$x = -206$

Thus, (−206) ÷ (-206) = 1

(d) Given: − 87 ÷ _____ = 87

Let x be the missing integer,

$(-87) \div (x) = 87$

$x = (-87/87)$

$x = -1$

Thus, (− 87) ÷ (-1) = 87

(e) Given: _____ ÷ 1 = − 87

Let x be the missing integer,

$(x) \div (1) = -87$

$x = (-87 \times 1)$

$x = -87$

Thus, (− 87) ÷ (1) = -87

(f) Given: _____ ÷ 48 = −1

Let x be the missing integer,

$(x) \div 48 = -1$

$x = (-1) \times 48$

$x = -48$

Thus, (-48) ÷ 48 = −1

(g) Given: 20 ÷ _____ = −2

Let x be the missing integer,

$20 \div (x) = -2$

$x = (20) / -2$

$x = -10$

Thus, 20 ÷ (-10) = −2

(h) Given: _____ ÷ (4) = −3
Let x be the missing integer,
$(x) \div (4) = -3$
$x = (-3) \times 4$
$x = -12$
Thus, $(-12) \div (4) = -3$

Q. 4 Write five pairs of integers (a, b) such that a ÷ b = −3. One such pair is (6, −2) because 6 ÷ (−2) = (−3).
Sol: The five pairs of integers (a, b) such that a ÷ b = −3
(i) First pair: (15, -5)
Since, 15 ÷ (−5) = (−3)
(ii) Second pair: (-24, 8)
Since, (-24) ÷ (8) = (−3)
(iii) Third pair: (-18, 6)
Since, (-18) ÷ (6) = (−3)
(iv) Fourth pair: (-60, 20)
Since, (-60) ÷ (20) = (−3)
(v) Fifth pair: (21, -7)
Since, 21 ÷ (−7) = (−3)

Q.5 The temperature at 12 noon was 10°C above zero. If it decreases at the rate of 2°C per hour until midnight, at what time would the temperature be 8°C below zero?
What would be the temperature at mid-night?
Sol: **Given:** Temperature at 12 noon = +10°C i.e. above zero
And rate of decrease of temperature = 2°C per hour
So,
Temperature at the time 1 p.m. = 10 + (-2)
= 10 − 2
= 8°C
Temperature at the time 2 p.m. = 8 + (-2)
= 8 − 2
= 6°C
Temperature at the time 3 p.m. = 6 + (-2)
= 6 − 2
= 4°C
Temperature at the time 4 p.m. = 4 + (-2)
= 4 − 2
= 2°C
Temperature at the time 5 p.m. = 2 + (-2)
= 2 − 2
= 0°C
Temperature at the time 6 p.m. = 0 + (-2)
= 0 − 2
= -2°C
Temperature at the time 7 p.m. = -2 + (-2)
= -2 -2
= -4°C
Temperature at the time 8 p.m. = -4 + (-2)
= -4 − 2
= -6°C
Temperature at the time 9 p.m. = -6 + (-2)

= -6 – 2
= -8°C
Thus, the temperature will be 8°C below zero at 9 p.m.
Now, for temperature at mid-night i.e., at 12 a.m.
Since, change in temperature in 12 hours = -2°C × 12
= – 24°C
Therefore, at midnight temperature = 10 + (-24)
= – 14°C
Thus, the temperature at midnight = -14°C or 14°C below zero.

Q.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?

Sol: Since, marks are given for one correct answer = + 3
And marks are given for one wrong answer = -2
(i) Given: Radhika scored = 20 marks
Radhika awarded the marks for 12 correct answers will be = 12 × 3 = 36
So, marks awarded for incorrect answers = Total score – Marks awarded for 12 correct Answers
= 20 – 36
= – 16
Therefore, the number of incorrect answers marked by Radhika will be
= marks awarded for incorrect answers ÷ marks awarded for one wrong answer
= (-16) ÷ (-2)
= 8
(ii) Given: Mohini scored = -5 marks
Mohini awarded the marks for 7 correct answers will be = 7 × 3 = 21
So, marks awarded for incorrect answers = Total score – Marks awarded for 12 correct Answers
= – 5 – 21
= – 26
Therefore, the number of incorrect answers marked by Mohini will be
= marks awarded for incorrect answers ÷ marks awarded for one wrong answer
= (-26) ÷ (-2)
= 13

Q.7 An elevator descends into a mine shaft at the rate of 6 m/min. If the descent starts from 10 m above the ground level, how long will it take to reach – 350 m.

Sol: **Given:** Starting height of the elevator = 10 m
And depth of elevator = – 350 m
Here, negative sign shows descend distance.
So, total distance descended by the elevator = (-350) – (10)
= – 360 m
Since, elevator descends into a mine shaft at the rate of 6 m/min
It means that time taken by the elevator to descend -6 m = 1 min
So, time taken by the elevator to descend – 360 m = (-360) ÷ (-60)
= 60 minutes or 1 hour