Exercise 1.3

Question 1:

Find the each of the following products:

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

Answer 1:

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

Question 2:

Verify the following:

(a) 18 x [7 + (–3)] = [18 x 7] + [18 x (–3)]
(b) (–21) x [(–4) + (–6)] = [(–21) x (-4)] + [(–21) x (–6)]

Answer 2:

(a) 18 x [7 + (–3)] = [18 x 7] + [18 x (–3)]
⇒ 18 x 4 = 126 + (–54)
⇒ 72 = 72
⇒ L.H.S. = R.H.S.
Hence verified.

(b) (–21) x [(–4) + (–6)] = [(–21) x (–4)] + [(–21) x (–6)]
⇒ (–21) x (–10) = 84 + 126
⇒ 210 = 210
⇒ 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.

Question 5:

Find the product, using suitable properties:

(a) $26\times(-48)+(-48)\times(-36)$

(b) $8\times 53\times(-125)$

(c) $15\times(-25)\times(-4)\times(-10)$

(d) $(-41)\times(102)$

(e) $625\times(-35)+(-625)\times 65$

(f) $7\times(50-2)$

(g) $(-17)\times(-29)$

(h) $(-57)\times(-19)+57$

Answer 5:

(a) $26\times(-48)+(-48)\times(-36)$

$\Rightarrow \quad (-48)\times[26+(-36)]$ [Distributive property]

$\Rightarrow \quad (-48)\times(-10)$

$\Rightarrow \quad 480$

(b) $8\times53\times(-125)$

$\Rightarrow \quad 53\times[8\times(-125)]$ [Commutative property]

$\Rightarrow \quad 53\times(-1000)$

$\Rightarrow \quad -53000$

(c) $15\times(-25)\times(-4)\times(-10)$

$\Rightarrow \quad 15\times[(-25)\times(-4)\times(-10)]$ [Commutative property]

$\Rightarrow \quad 15\times(-1000)$

$\Rightarrow \quad -15000$

(d) $(-41)\times(102)$

$\Rightarrow \quad -41\times[100+2]$ [Distributive property]

$\Rightarrow \quad [(-41)\times100]+[(-41)\times2]$

$\Rightarrow \quad -4100+(-82)$

$\Rightarrow \quad -4182$

(e) $625\times(-35)+(-625)\times65$

$\Rightarrow \quad 625\times[(-35)+(-65)]$ [Distributive property]

$\Rightarrow \quad 625\times(-100)$

$\Rightarrow \quad -62500$

(c) $7\times(50-2)$

$\Rightarrow \quad 7\times50-7\times2$ [Distributive property]

$\Rightarrow \quad 350-14=336$

(d) $(-17)\times(-29)$

$\Rightarrow$ $(-17)\times[(-30)+1]$ [Distributive property]

$\Rightarrow$ $(-17)\times(30)+(-17)\times 1$

$\Rightarrow$ $510+(-17)$

$\Rightarrow$ 493

(e) $(-57)\times(-19)+57$

$\Rightarrow$ $(-57)\times(-19)+57\times 1$

$\Rightarrow$ 57 x 19 + 57 x 1

$\Rightarrow$ 57 x (19 + 1) [Distributive property]

$\Rightarrow$ 57 x 20 = 1140

Question 6:

A certain freezing process requires that room temperature be lowered from 40°C at the rate of 5°C every hour. What will be the room temperature 10 hours after the process begins?

Answer 6:

Given: Present room temperature = 40°C

Decreasing the temperature every hour = 5°C

Room temperature after 10 hours = 40°C + 10 x (–5°C)

= 40°C – 50°C

= – 10°C

Thus, the room temperature after 10 hours is – 10°C after the process begins.

Question 7:

In a class test containing 10 questions, 5 marks are awarded for every correct answer and (-2) marks are awarded for every incorrect answer and 0 for questions not attempted.

(i) Mohan gets four correct and six incorrect answers. What is his score?

(ii) Reshma gets five correct answers and five incorrect answers, what is her score?

(iii) Heena gets two correct and five incorrect answers out of seven questions she attempts. What is her score?

Answer 7:

(i) Mohan gets marks for four correct questions = 4 x 5 = 20
He gets marks for six incorrect questions = 6 x (–2) = –12
Therefore, total scores of Mohan = (4 x 5) + [6 x (–2)]
= 20 – 12 = 8
Thus, Mohan gets 8 marks in a class test.

(ii) Reshma gets marks for five correct questions = 5 x 5 = 25
She gets marks for five incorrect questions = 5 x (–2) = –10
Therefore, total score of Resham = 25 + (–10) = 15
Thus, Reshma gets 15 marks in a class test.

(iii) Heena gets marks for two correct questions = 2 x 5 = 10
She gets marks for five incorrect questions = 5 x (–2) = –10
Therefore, total score of Resham = 10 + (–10) = 0
Thus, Reshma gets 0 marks in a class test.

Question 8:

A cement company earns a profit of ₹8 per bag of white cement sold and a loss of ₹ 5 per bag of grey cement sold.

(a) The company sells 3,000 bags of white cement and 5,000 bags of grey cement in a month. What is its profit or loss?

(b) What is the number of white cement bags it must sell to have neither profit nor loss. If the number of grey bags sold is 6,400 bags.

Answer 8:

Given: Profit of 1 bag of white cement = ₹ 8
And Loss of 1 bag of grey cement = ₹ 5

(a) Profit on selling 3000 bags of white cement = 3000 x ₹ 8 = ₹ 24,000
Loss of selling 5000 bags of grey cement = 5000 x ₹ 5 = ₹ 25,000
SinceProfit < Loss
Therefore, his total loss on selling the grey cement bags = Loss – Profit
= ₹ 25,000 – ₹ 24,000
= ₹ 1,000
Thus, he has lost of `₹1,000 on selling the grey cement bags.

(b) Let the number of bags of white cement be x.

According to question, Loss = Profit

$\therefore$ 5 x 6,400 = x x 8

$\Rightarrow$ $x = \frac{5 \times 6400}{8}$ = 5000 bags

Thus, he must sell 4000 white cement bags to have neither profit nor loss.

Question 9:

Replace the blank with an integer to make it a true statement:

(a) $(-3) \times \_\_\_\_\_ = 27$

(b) $5 \times \_\_\_\_\_ = -35$

(c) $\_\_\_\_\_ \times (-8) = -56$

(d) $\_\_\_\_\_ \times (-12) = 132$

Answer 9:

(a) $(-3) \times \underline{(-9)} = 27$

(b) $5 \times \underline{(-7)} = -35$

(c) $\underline{7} \times (-8) = -56$

(d) $\underline{(-11)} \times (-12) = 132$