

Exercise 1.1

Q1) Determine each of the following products:

(i) 12×7

Solution:

We have,

$$12 \times 7 = 84$$

their absolute value]

[The product of two integers of like signs is equal to the product of

(ii) $(-15) \times 8$

Solution:

We have,

$$(-15) \times 8$$

$$= (-15 \times 8)$$

$$= -120$$

[The product of two integers of opposite

signs is equal to the additive inverse of the

product of their absolute values]

(iii) $(-25) \times (-9)$

Solution:

We have,

$$(-25) \times (-9)$$

$$= +(25 \times 9)$$

$$= 225$$

$$(iv) (125) \times (-8)$$

Solution:

We have,

$$\begin{aligned} & (125) \times (-8) \\ &= -(125 \times 8) \\ &= -1000 \end{aligned}$$

Q2) Find each of the following products:

$$(i) 3 \times (-8) \times 5$$

Solution:

We have,

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

$$(ii) 9 \times (-3) \times (-6)$$

Solution:

We have,

$$\begin{aligned} & 9 \times (-3) \times (-6) \\ &= -(9 \times 3) \times (-6) \\ &= (-27) \times (-6) \\ &= +(27 \times 6) \\ &= 162 \end{aligned}$$

$$(iii) (-2) \times 36 \times (-5)$$

Solution:

We have,

$$\begin{aligned} & (-2) \times 36 \times (-5) \\ &= -(2 \times 36) \times (-5) \\ &= (-72) \times (-5) \\ &= (72 \times 5) \\ &= 360 \end{aligned}$$

$$(iv) (-2) \times (-4) \times (-6) \times (-8)$$

Solution:

$$\begin{aligned} & (-2) \times (-4) \times (-6) \times (-8) \\ &= (2 \times 4) \times (6 \times 8) \\ &= (8 \times 48) \\ &= 384 \end{aligned}$$

Q3) Find the value of:

$$(i) 1487 \times 327 + (-487) \times 327$$

Solution:

We have,

$$\begin{aligned} & 1487 \times 327 + (-487) \times 327 \\ &= 486249 - 159249 \\ &= 327000 \end{aligned}$$

Is the multiplication table symmetrical about the diagonal joining the upper left corner to the lower right corner?

Solution:

Second number

X	-4	-3	-2	-1	0	1	2	3	4
-4	16	12	8	4	0	-4	-8	-12	-16
<div><div>First number</div></div>	12	9	6	3	0	-3	-6	-9	-12
-3									
-2	8	6	4	2	0	-2	-4	-6	-8
-1	4	3	2	1	0	-1	-2	-3	-4
0	0	0	0	0	0	0	0	0	0
1	-4	-3	-2	-1	0	1	2	3	4
2	-8	-6	-4	-2	0	2	4	6	8
3	-12	-9	-6	-3	0	3	6	9	12
4	-16	-12	-8	-4	0	4	8	12	16

Q5) Determine the integer whose product with '-1' is

(i) 58

Solution:

$$58 \times (-1) = -(58 \times 1)$$

$$= -58$$

(ii) 0

Solution:

$$0 \times (-1) = 0$$

(iii) -225

Solution:

$$(-225) \times (-1) = +(225 \times 1)$$

$$= 225$$

Q6) What will be the sign of the product if we multiply together

(i) 8 negative integers and 1 positive integer?

(ii) 21 negative integers and 3 positive integers?

(iii) 199 negative integers and 10 positive integers?

Solution:

(i) Positive $\because [-ve \times -ve = +ve]$

(ii) Negative $\because [-ve \times +ve = -ve]$

(iii) Negative

Q7) State which is greater:

(i) $(8 + 9) \times 10$ and $8 + 9 \times 10$

Solution:

$$(8 + 9) \times 10 = 17 \times 10 = 170 \quad 8 + 9 \times 10 = 8 + 90 = 98 \quad (8 + 9) \times 10 > 8 + 9 \times 10$$

(ii) $(8 - 9) \times 10$ and $8 - 9 \times 10$

Solution:

$$(8 - 9) \times 10 = -1 \times 10 = -10 \quad 8 - 9 \times 10 = 8 - 90 = -82 \quad (8 - 9) \times 10 > 8 - 9 \times 10$$

(iii) $((-2) - 5) \times -6$ and $(-2) - 5 \times (-6)$

Solution:

$$((-2) - 5) \times -6 = (-7) \times (-6)$$

$$= (7 \times 6)$$

$$= 42$$

$$(-2) - 5 \times (-6) = -2 + (5 \times 6)$$

$$= 30 - 2$$

$$= 28$$

$$\text{Therefore, } ((-2) - 5 \times (-6)) > (-2) - 5 \times (-6)$$

Q8) (i) If $a \times (-1) = -30$, is the integer a positive or negative?

Solution:

When multiplied by 'a' negative integer, a gives a negative integer. Hence, 'a' should be a positive integer.

$$a = 30$$

(ii) If $a \times (-1) = 30$, is the integer a positive or negative?

Solution:

When multiplied by 'a' negative integer, a gives a positive integer. Hence, 'a' should be a negative integer.

$$a = -30$$

Q9) Verify the following:

(i) $19 \times (7 + (-3)) = 19 \times 7 + 19 \times (-3)$

Solution:

$$\text{L.H.S} = 19 \times (7 + (-3))$$

$$= 19 \times (7 - 3)$$

$$= 19 \times 4$$

$$= 76$$

$$\text{R.H.S} = 19 \times 7 + 19 \times (-3)$$

$$= 133 - 57$$

$$= 76$$

Therefore, L.H.S = R.H.S

(ii) $(-23)[(-5) + (+19)] = (-23) \times (-5) + (-23) \times (+19)$

Solution:

$$\text{L.H.S} = (-23)[(-5) + (+19)]$$

$$= (-23)[-5 + 19]$$

$$= (-23)[14]$$

$$= -322$$

$$\text{R.H.S} = (-23) \times (-5) + (-23) \times (+19)$$

$$= 115 - 437$$

$$= -322$$

Therefore, L.H.S = R.H.S

Q10) Which of the following statements are true?

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

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

(iii) Of the two integers, if one is negative, then their product must be positive.

(iv) For all non-zero integers a and b , $a \times b$ is always greater than either a or b .

(v) The product of a negative and a positive integer may be zero.

(vi) There does not exist an integer b such that for $a > 1$, $a \times b = b \times a = b$.

Solution:

(i) True

(vi) True

(ii) True

(iii) False

(iv) False

(v) False

Exercise 1.2

Q1) Divide:

(i) 102 by 17

Solution:

$$\frac{102}{17} = \left| \frac{102}{17} \right| = \frac{102}{17} = 6$$

(ii) -85 by 5

Solution:

We have,

$$\left| \frac{85}{5} \right| = \frac{-85}{5} = -17$$

(iii) -161 by -23

Solution:

We have,

$$\left| \frac{-161}{-23} \right| = \frac{161}{23} = 7$$

(iv) 76 by -19

Solution:

$$\left| \frac{76}{-19} \right| = \frac{76}{-19} = -\frac{76}{19} = -4$$

(v) 17654 by -17654

Solution:

$$\frac{17654}{-17654} = -\frac{17654}{17654} = -1$$

(vi) (-729) by (-27)

Solution:

$$\frac{-729}{-27} = +\frac{729}{27} = 27$$

(vii) 21590 by -10

Solution:

$$\frac{21590}{-10} = -\frac{21590}{10} = 2159$$

(viii) 0 by -135

Solution:

$$\frac{0}{-135} = 0$$

Q2) Fill in the blanks:

(i) $296 \div \dots = -148$

Solution:

$$\frac{296}{|-148|} = -\frac{296}{148} = -2$$

(ii) $-88 \div \dots = 11$

Solution:

$$\frac{|-88|}{11} = -\frac{88}{11} = -8$$

(iii) $84 \div \dots = 12$

Solution:

$$\frac{84}{12} = 7$$

(iv) $\dots \div -5 = 25$

Solution:

$$\dots \div -5 = 25 \quad 25 \times (-5) = -125$$

$$(v) \dots \div 156 = -2$$

Solution:

$$\begin{aligned}\dots \div 156 &= -2 - (156 \times 2) \\ &= -312\end{aligned}$$

$$(vi) \dots \div 567 = -1$$

Solution:

$$\begin{aligned}\frac{x}{567} &= -1 \Rightarrow x = -(567 \times 1) \\ &= -567\end{aligned}$$

$$\therefore \frac{-567}{567} = 1$$

Q3) Which of the following statements are true?

$$(i) 0 \div 4 = 0$$

$$(ii) 0 \div (-7) = 0$$

$$(iii) -15 \div 0 = 0$$

$$(iv) 0 \div 0 = 0$$

$$(v) (-8) \div (-1) = -8$$

$$(vi) -8 \div (-2) = 4$$

Solution:

(i) True

(ii) True

(iii) False

(iv) False

(v) False

(vi) True

Exercise 1.3

Find the value of

Q1) $36 \div 6 + 3$.

Solution:

$$\begin{aligned} 36 \div 6 + 3 &= 6 + 3 \\ &= 9 \end{aligned}$$

Q2) $24 + 15 \div 3$.

Solution:

$$\begin{aligned} 24 + 15 \div 3 &= 24 + 5 \\ &= 29 \end{aligned}$$

Q3) $120 - 20 \div 4$.

Solution:

$$\begin{aligned} 120 - 20 \div 4 &= 120 - 5 \\ &= 115 \end{aligned}$$

Q4) $32 - (3 \times 5) + 4$.

Solution:

$$\begin{aligned} 32 - (3 \times 5) + 4 &= 32 - 15 + 4 \\ &= 17 + 4 \\ &= 21 \end{aligned}$$

$$Q5) 3 - (5 - 6 \div 3).$$

Solution:

$$\begin{aligned} 3 - (5 - 6 \div 3) &= 3 - (5 - 2) \\ &= 3 - 3 \\ &= 0 \end{aligned}$$

$$Q6) 21 - 12 \div 3 \times 2.$$

Solution:

$$\begin{aligned} 21 - 12 \div 3 \times 2 &= 21 - \frac{12}{3} \times 2 \\ &= 21 - 4 \times 2 \\ &= 21 - 8 \\ &= 13 \end{aligned}$$

$$Q7) 16 + 8 \div 4 - 2 \times 3.$$

Solution:

$$\begin{aligned} 16 + 8 \div 4 - 2 \times 3 \\ &= 16 + 2 - 6 \\ &= 18 - 6 \\ &= 12 \\ \therefore 16 + 8 \div 4 - 2 \times 3 &= 12 \end{aligned}$$

Q8) $28 - 5 \times 6 + 2.$

Solution:

$$28 - 5 \times 6 + 2 = 28 - (5 \times 6) + 2$$

$$= 28 - 30 + 2$$

$$= 30 - 30$$

$$= 0$$

Q9) $(-20) \times (-1) + (-28) \div 7.$

Solution:

$$(-20) \times (-1) + (-28) \div 7 = 20 + \frac{|-28|}{|7|}$$

$$= 20 - \frac{28}{7}$$

$$= 20 - 4$$

$$= 16$$

Q10) $(-2) + (-8) \div (-4).$

Solution:

$$(-2) + (-8) \div (-4) = -2 + \frac{|-8|}{|-4|}$$

$$= -2 + 2$$

$$= 0$$

Q11) $(-15) + 4 \div (5 - 3).$

Solution:

$$-15 + 4 \div (5 - 3) = -15 + 4 \div 2$$

$$= -15 + 2$$

$$= -13$$

$$-15 + 4 \div (5 - 3) = -13$$

$$Q12) (-40) \times (-1) + (-28) \div 7.$$

Solution:

$$(-40) \times (-1) + (-28) \div 7 = 40 + (-4)$$

$$= 40 - 4$$

$$= 36$$

$$Q13) (-3) + (-8) \div (-4) - 2 \times (-2).$$

Solution:

$$(-3) + (-8) \div (-4) - 2 \times (-2) = (-3) + \frac{(-8)}{(-4)} - 2 \times (-2)$$

$$= -3 + 2 + 4$$

$$= 6 - 3$$

$$= 3$$

$$Q14) (-3) \times (-4) \div (-2) + (-1).$$

Solution:

$$(-3) \times (-4) \div (-2) + (-1) = 12 \div (-2) + (-1)$$

$$= -6 - 1$$

$$= -7$$

$$\therefore (-3) \times (-4) \div (-2) + (-1) = -7$$

Exercise 1.4

Simplify each of the following:

(i) $3 - (5 - 6 \div 3)$

Solution:

$$3 - (5 - 6 \div 3)$$

$$= 3 - (5 - 2)$$

$$= 3 - 3$$

$$= 0$$

$$\therefore 3 - (5 - 6 \div 3) = 0$$

(ii) $-25 + 14 \div (5 - 3)$

Solution:

$$-25 + 14 \div (5 - 3) = -25 + 14 \div (2)$$

$$= -25 + \frac{14}{2}$$

$$= -25 + 7$$

$$= -18$$

$$\therefore -25 + 14 \div (5 - 3) = -18$$

(iii) $25 - \frac{1}{2}(5 + 4 - (3 + 2 - \overline{1 + 3}))$

Solution:

$$25 - \frac{1}{2}[5 + 4 - (3 + 2 - \overline{1 + 3})]$$

$$= 25 - \frac{1}{2}[5 + 4 - (5 - 4)]$$

$$= 25 - \frac{1}{2}[5 + 4 - 1]$$

$$= 25 - \frac{1}{2}[8]$$

$$= 25 - 4$$

$$= 21$$

$$\therefore 25 - \frac{1}{2}(5 + 4 - (3 + 2 - \overline{1 + 3})) = 21$$

$$(iv) 27 - [38 - (46 - (15 - \overline{13 - 2}))]$$

Solution:

$$27 - [38 - (46 - (15 - \overline{13 - 2}))]$$

$$= 27 - [38 - (46 - (15 - 11))]$$

$$= 27 - [38 - (46 - 4)]$$

$$= 27 - [38 - 42]$$

$$= 27 - [-4]$$

$$= 27 + 4$$

$$= 31$$

$$\therefore 27 - [38 - (46 - (15 - \overline{13 - 2}))] = 31$$

$$(v) 36 - [18 - (14 - (15 - 4 \div 2 \times 2))]$$

Solution:

$$36 - [18 - (14 - (15 - 4 \div 2 \times 2))]$$

$$= 36 - [18 - (14 - (11 \div 2 \times 2))]$$

$$= 36 - [18 - (14 - \frac{11}{2} \times 2)]$$

$$= 36 - [18 - (14 - 11)]$$

$$= 36 - [18 - 3]$$

$$= 36 - 15$$

$$= 21$$

$$\therefore 36 - [18 - (14 - (15 - 4 \div 2 \times 2))] = 21$$

$$(vi) 45 - [38 - (60 \div 3 - (6 - 9 \div 3) \div 3)]$$

Solution:

$$45 - [38 - (60 \div 3 - (6 - 9 \div 3) \div 3)]$$

$$= 45 - [38 - (20 - (6 - 3) \div 3)]$$

$$= 45 - [38 - (20 - 3 \div 3)]$$

$$= 45 - [38 - (20 - 1)]$$

$$= 45 - [38 - 19]$$

$$= 45 - [19]$$

$$= 26$$

$$\therefore 45 - [38 - (60 \div 3 - (6 - 9 \div 3) \div 3)] = 26$$

$$(vii) 23 - [23 - (23 - (23 - \overline{23 - 23}))]$$

Solution:

$$23 - [23 - (23 - (23 - \overline{23 - 23}))]$$

$$= 23 - [23 - (23 - (23 - 0))]$$

$$= 23 - [23 - (23 - 23)]$$

$$= 23 - [23 - 0]$$

$$= 23 - 23$$

$$= 0$$

$$\therefore 23 - [23 - (23 - (23 - \overline{23 - 23}))] = 0$$

$$(viii) 2550 - [510 - (270 - (90 - \overline{80 + 70}))]$$

Solution:

$$2550 - [510 - (270 - (90 - \overline{80 + 70}))]$$

$$= 2550 - [510 - (270 - (90 - 150))]$$

$$= 2550 - [510 - (270 - (-60))]$$

$$= 2550 - [510 - 330]$$

$$= 2550 - [180]$$

$$= 2550 - 180$$

$$= 2370$$

$$\therefore 2550 - [510 - (270 - (90 - \overline{80 + 70}))] = 2370$$

$$(ix) 4 + \frac{1}{5} [(-10 \times (25 - \overline{13 - 3})) \div (-5)]$$

Solution:

$$4 + \frac{1}{5} [(-10 \times (25 - \overline{13 - 3})) \div (-5)]$$

$$= 4 + \frac{1}{5} [(-10 \times (25 - 10)) \div (-5)]$$

$$= 4 + \frac{1}{5} [(-10 \times (15)) \div (-5)]$$

$$= 4 + \frac{1}{5} [(-150) \div (-5)]$$

$$= 4 + \frac{1}{5} [30]$$

$$= 4 + 6$$

$$= 10$$

$$\therefore 4 + \frac{1}{5} [(-10 \times (25 - \overline{13 - 3})) \div (-5)] = 10$$

$$(x) 22 - \frac{1}{4}(-5 - (-48) \div (-16))$$

Solution:

$$22 - \frac{1}{4}(-5 - (-48) \div (-16))$$

$$= 22 - \frac{1}{4}(-5 - (\frac{-48}{-16}))$$

$$= 22 - \frac{1}{4}(-5 - \frac{48}{16})$$

$$= 22 - \frac{1}{4}(-5 - 3)$$

$$= 22 - \frac{1}{4}(-8)$$

$$= 22 + \frac{8}{4}$$

$$= 22 + 2$$

$$= 24$$

$$\therefore 22 - \frac{1}{4}(-5 - (-48) \div (-16)) = 24$$

$$(xi) 63 - [(-3)(-2 - \overline{8 - 3})] \div [3(5 + (-2)(-1))]$$

Solution:

$$63 - [(-3)(-2 - \overline{8 - 3})] \div [3(5 + (-2)(-1))]$$

$$= 63 - [(-3)(-2 - 5)] \div [3(5 + 2)]$$

$$= 63 - [(-3)(-7)] \div [3(7)]$$

$$= 63 - [21] \div [21]$$

$$= 63 - 1$$

$$= 62$$

$$\therefore 63 - [(-3)(-2 - \overline{8 - 3})] \div [3(5 + (-2)(-1))] = 62$$

$$(xii) [29 - (-2)(6 - (7 - 3))] \div [3 \times (5 + (-3) \times (-2))]$$

Solution:

$$[29 - (-2)(6 - (7 - 3))] \div [3 \times (5 + (-3) \times (-2))]$$

$$= [29 - (-2)(6 - 4)] \div [3 \times (5 + (3 \times 2))]$$

$$= [29 - (-2)(2)] \div [3 \times (5 + 6)]$$

$$= [29 + 4] \div [3 \times 11]$$

$$= [33] \div [33]$$

$$= 1$$

$$\therefore [29 - (-2)(6 - (7 - 3))] \div [3 \times (5 + (-3) \times (-2))] = 1$$

Q13) Using brackets, write a mathematical expression for each of the following:

(i) Nine multiplied by the sum of two and five.

(ii) Twelve divided by the sum of one and three.

(iii) Twenty divided by the difference of seven and two.

(iv) Eight subtracted from the product of two and three.

(v) Forty divided by one more than the sum of nine and ten.

(vi) Two multiplied by one less than the difference of nineteen and six.

Solution:

(i) $9(2 + 5)$

(ii) $12 \div (1 + 3)$

(iii) $20 \div (7 - 2)$

(iv) $2 \times 3 - 8$

(v) $40 \div [1 + (9 + 10)]$

(vi) $2 \times [(19 - 6) - 1]$