

1. Integers

Exercise 1.1

Solution 1:

^{8/11}
Solution-01:-

(i) we have,
 $12 \times 7 = 84$.
[The Product of two integers of like signs is equal to the product of their absolute value]

(ii) 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) we have,
 $(-25) \times (-9)$
 $= +(25 \times 9)$
 $= 225$
 $(-25) \times (-9) = 225$

(iv) $125 \times (-8)$
 $= -(125 \times 8)$
 $= -1000, = -1000$
 $125 \times (-8) = -1000 = -1000$

Solution 2:

Solution-02:-

(i) we have,
 $3 \times (-8) \times 5$
 $= -(3 \times 8) \times 5$
 $= (-24) \times 5$
 $= -(24 \times 5)$
 $= -120$.

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

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

$$\begin{aligned}
 \text{(iv)} \quad (-2) \times (-4) \times (-6) \times (-8) &= +(2 \times 4) \times (6 \times 8) \\
 &= 8 \times 48 \\
 &= 384.
 \end{aligned}$$

Solution 3:

Solution-03:-

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

$$\begin{aligned}
 \text{(ii)} \quad 28945 \times 99 - (-28945) \\
 &= 2865555 - 28945 \\
 &= 2894500.
 \end{aligned}$$

Solution 4:

or Yes.

X	-4	-3	-2	-1	0	1	2	3	4
-4	16	12	8	4	0	-4	-8	-12	-16
-3	12	9	6	3	0	-3	-6	-9	-12
-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

Solution 5:

Solution-05:-

$$\begin{aligned}
 \text{(i)} \quad 58 \times (-1) &= -(58 \times 1) \\
 &= -58
 \end{aligned}$$

$$\text{(ii)} \quad 0 \times (-1) = 0$$

$$\begin{aligned}
 \text{(iii)} \quad (-225) \times (-1) &= +(225 \times 1) \\
 &= 225.
 \end{aligned}$$

Solution 6:

Solution-06:-

06. (i) negative positive [+ve] [$\because -ve \times -ve = +ve$]
 (ii) negative [$-ve \times +ve = -ve$]
 (iii) negative value.

Solution 7:

Solution -07:-

$$(i) (8+9) \times 10 = 17 \times 10 \\ = 170$$

$$8+9 \times 10 = 8+90 = 98$$

$$(8+9) \times 10 > 8+9 \times 10.$$

$$(ii) (8-9) \times 10 = (-1) \times 10 \\ = -(1 \times 10) \\ = -10$$

$$8-9 \times 10 = 8-90 \\ = -82$$

$$-10 > -82$$

$$(8-9) \times 10 > 8-9 \times 10.$$

$$(iii) \{ (-2) \times 5 \} \times \{ -6 \} = (-7) \times (-6) \\ = (7 \times 6) \\ = 42$$

$$-2 - 5 \times (-6) = -2 + (5 \times 6) \\ = 30 - 2 \\ = 28$$

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

Solution 8:

Solution 8:

$$(i) a \times (-1) = -30$$

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

$$a = 30.$$

$$(ii) a \times (-1) = 30$$

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

$$a = -30.$$

Solution 9:

Solution-09:-

$$(i) LHS = 19 \times \{ 7 + (-3) \} \\ = 19 \times \{ 7 - 3 \} \\ = 19 \times 4 \\ = 76$$

$$RHS = 19 \times 7 + 19 \times (-3) \\ = 133 - 57 \\ = 76$$

$$\therefore LHS = RHS.$$

Solution 10:

Solution-10:-

- (i) True
- (ii) True
- (iii) False
- (iv) False
- (v) False
- (vi) True

Exercise 1.2

Solution 1:

Exercise-1.2

Solution-01:-

$$1>(i) \frac{102}{17} = \frac{11021}{1171} = \frac{102}{17} = 6$$

(ii) we have,

$$\frac{-85}{151} = -\frac{85}{5} = -17$$

(iii) we have,

$$\frac{-1611}{-231} = \frac{161}{23} = 7$$

(iv) we have

$$\frac{76}{-19} = \frac{1761}{-191} = -\frac{76}{19} = -4.$$

$$(v) \frac{17654}{-17654} = -\frac{17654}{17654} = -1.$$

$$(vi) \frac{-29}{-27} = +\frac{29}{27} = 27.$$

$$\begin{aligned} 1.(vii) &:- \frac{21590}{-10} \\ &= \frac{|21590|}{|-10|} \\ &= -\frac{21590}{10} \\ &= -2159 \end{aligned}$$

$$\begin{aligned} (viii) &\frac{0}{-135} \\ &= 0. \end{aligned}$$

Solution 2:

$$(i) 296 \div -148 = -\frac{|296|}{|-148|} = -\frac{|296|}{|148|} = -\frac{296}{148} = -2$$

$$\therefore 296 \div (-2) = -148$$

$$(ii) -88 \div 11 = -\frac{|-88|}{|11|} = -\frac{|88|}{|11|} = -\frac{88}{11} = -8$$

$$\therefore -88 \div -8 = 11$$

$$(iii) 84 \div 12 = \frac{|84|}{|12|} = \frac{84}{12} = 7$$

$$\therefore 84 \div 7 = 12$$

$$(iv) 25 \times (-5) = -125$$

$$\therefore -125 \div -5 = 25$$

$$(v) 156 \times (-2) = -312$$

$$\therefore -312 \div 156 = -2$$

$$(vi) 567 \times (-1) = -567$$

$$\therefore -567 \div 567 = -1$$

Solution 3:

Solution - 03

(i) True

(ii) True

(iii) False

(iv) False

(v) False.

(vi) True

Exercise 1.3

Solution 1:

Solution - 01.

$$\begin{aligned} 36 \div 6 + 3 &= 36 \div 9 \\ &= \frac{36}{9} \\ &= \frac{|36|}{|9|} \\ &= 4. \end{aligned}$$

Solution 2:

Solution - 02:-

$$\begin{aligned} 24 + 15 \div 3 &= 39 \div 3 \\ &= \frac{|39|}{|3|} \\ &= 13. \end{aligned}$$

Solution 3:

Solution-03:-

$$\begin{aligned}120 - 20 \div 4 &= 100 \div 4 \\&= \frac{100}{4} \\&= 25. \\ \therefore 120 - 20 \div 4 &= 25.\end{aligned}$$

Solution 4:

Solution-04:-

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

Solution 5:

Solution-05:-

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

Solution 6:

Solution-06:-

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

Solution 7:

Solution-07:-

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

$$\therefore 16 + 8 \div 4 - 2 \times 3 = 12.$$

Solution 8:

Solution-08:-

$$\begin{aligned}28 - 5 \times 6 + 2 &= 28 - (5 \times 6) + 2 \\&= 28 - 30 + 2 \\&= 30 - 30 \\&= 0.\end{aligned}$$

Solution 9:

Solution-09:-

$$\begin{aligned}(-20) \times (-1) + (-28) \div 7 &= 20 + \frac{-28}{7} \\&= 20 - \frac{28}{7} \\&= 20 - 4 \\&= 16.\end{aligned}$$

Solution 10:

Solution-10:-

$$\begin{aligned}
 (-2) + (-8) \div (-4) &= -2 + \frac{(-8)}{(-4)} \\
 &= -2 + 2 \\
 &= 0.
 \end{aligned}$$

Solution 11:

Solution-11:-

$$\begin{aligned}
 -15 + 4 \div (5-3) &= -15 + 4 \div 2 \\
 &= -15 + 2 \\
 &= -13 \\
 \therefore -15 + 4 \div (5-3) &= -13.
 \end{aligned}$$

Solution 12:

Solution-12:-

$$\begin{aligned}
 (-40) \times (-1) + (-28) \div 7 &= 40 + (-4) \\
 &= 40 - 4 \\
 &= 36.
 \end{aligned}$$

Solution 13:

Solution-13:-

$$\begin{aligned}
 (-3) + (-8) \div (-4) - 2 \times (-2) &= (-3) + \frac{(-8)}{(-4)} - 2 \times (-2) \\
 &= -3 + 2 + 4 \\
 &= 6 - 3 \\
 &= 3.
 \end{aligned}$$

Solution 14:

Solution-14:-

$$\begin{aligned}
 (-3) \times (-4) \div (-2) + (-1) &= 12 \div (-2) + (-1) \\
 &= -6 - 1 \\
 &= -7 \\
 \therefore (-3) \times (-4) \div (-2) + (-1) &= -7.
 \end{aligned}$$

Exercise 1.4**Solution 1:**

Exercise-1.4

Solution-01:-

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

Solution 2:

Solution -02:-

$$\begin{aligned}-25 + 14 \div (5-3) &= -25 + 14 \div (2) \\ &= -25 + \frac{14}{2} \\ &= -25 + 7 \\ &= -18\end{aligned}$$

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

Solution 3:

Solution-03:-

$$\begin{aligned}25 - \frac{1}{2} \{ 5 + 4 - (3 + 2 - \overline{1+3}) \} \\ = 25 - \frac{1}{2} \{ 5 + 4 - (5 - 4) \} \\ = 25 - \frac{1}{2} \{ 5 + 4 - 1 \} \\ = 25 - \frac{1}{2} \{ 8 \} = 25 - 4 = 21. \\ \therefore 25 - \frac{1}{2} \{ 5 + 4 - (3 + 2 - \overline{1+3}) \} = 21.\end{aligned}$$

Solution 4:

Solution-04:-

$$\begin{aligned}27 - \{ 38 - \{ 46 - (15 - \overline{13-2}) \} \} \\ = 27 - [38 - \{ 46 - (15 - 11) \}] \\ = 27 - [38 - \{ 46 - 4 \}] \\ = 27 - [38 - 42] \\ = 27 - [-4] \\ = 27 + 4 \\ = 31. \\ \therefore 27 - \{ 38 - \{ 46 - (15 - \overline{13-2}) \} \} = 31.\end{aligned}$$

Solution 5:

Solution-05:-

$$\begin{aligned}36 - [18 - \{ 14 - (15 - 4 \div 2 \times 2) \}] \\ = 36 - [18 - \{ 14 - (11 \div 2 \times 2) \}] \\ = 36 - [18 - \{ 14 - \frac{11}{2} \times 2 \}] \\ = 36 - [18 - \{ 14 - 11 \}] \\ = 36 - [18 - 3] \\ = 36 - 15 \\ = 21. \\ 36 - [18 - \{ 14 - (15 - 4 \div 2 \times 2) \}] = 21.\end{aligned}$$

Solution 6:

Solution -06:-

we have,

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

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

$$= 45 - [38 - \{20 - 3 \div 3\}]$$

$$= 45 - [38 - \{20 - 1\}]$$

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

$$= 45 - 19$$

$$= 45 - 19$$

$$= 45 - 19 = 26$$

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

Solution 7:

Solution -07:-

we have,

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

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

$$= 23 - [23 - \{23 - 23\}]$$

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

$$= 23 - [23]$$

$$= 23 - 23$$

$$= 0$$

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

Solution 8:

Solution -08:-

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

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

$$= 2550 - [510 - \{270 - (-60)\}]$$

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

$$= 2550 - [180]$$

$$= 2550 - 180$$

$$= 2370$$

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

Solution 9:

Solution-09:-

$$\begin{aligned}
 & 4 + \frac{1}{5} \left[\frac{1}{2} - 10 \times (25 - \overline{13-3}) \right] \div (-5) \\
 & = 4 + \frac{1}{5} \left[\frac{1}{2} - 10 \times (25 - 10) \right] \div (-5) \\
 & = 4 + \frac{1}{5} \left[\frac{1}{2} - 10 \times (15) \right] \div (-5) \\
 & = 4 + \frac{1}{5} \left[\frac{1}{2} - 150 \right] \div (-5) \\
 & = 4 + \frac{1}{5} \times \frac{150}{2} \\
 & = 4 + \frac{1}{5} \times 75 \\
 & = 4 + 15 = 19 \\
 & \therefore 4 + \frac{1}{5} \left[\frac{1}{2} - 10 \times (25 - \overline{13-3}) \right] \div (-5) = 19.
 \end{aligned}$$

Solution 10:

Solution-10:-

we have,

$$\begin{aligned}
 & 22 - \frac{1}{4} \left\{ \frac{1}{2} - 5 - (-48) \div (-16) \right\} \\
 & = 22 - \frac{1}{4} \left\{ \frac{1}{2} - 5 + \frac{(-48)}{(-16)} \right\} \\
 & = 22 - \frac{1}{4} \left\{ \frac{1}{2} - 5 + \frac{148}{16} \right\} \\
 & = 22 - \frac{1}{4} \left\{ \frac{1}{2} - 5 + \frac{48}{16} \right\} \\
 & = 22 - \frac{1}{4} \left\{ \frac{1}{2} - 5 + 3 \right\} \\
 & = 22 - \frac{1}{4} \left\{ \frac{1}{2} - 2 \right\} \\
 & = 22 + \frac{3}{4} = 22 + 0.75 = 22.75 \\
 & \therefore 22 - \frac{1}{4} \left\{ \frac{1}{2} - 5 - (-48) \div (-16) \right\} = 22.75.
 \end{aligned}$$

Solution 11:

On applying the BODMAS rule, we get:

$$\begin{aligned}
 & 63 - (-3) \{ -2 - \overline{8-3} \} \div 3 \{ 5 + (-2)(-1) \} \\
 & = 63 - (-3) \{ -2 - 5 \} \div 3 \{ 5 + 2 \} \quad (\text{On simplifying vinculum}) \\
 & = 63 - (-3)(-7) \div 3 \times 7 \quad (\text{On simplifying braces}) \\
 & = 63 - (21 \div 21) \\
 & = 63 - 1 \\
 & = 62
 \end{aligned}$$

Solution 12:

Solution-12:-

$$\begin{aligned}
 & [29 - (-2) \{ 6 - (-3) \}] \div [3 \times \{ 5 + (-3) \times (-2) \}] \\
 & = [29 - (-2) \{ 6 + 3 \}] \div [3 \times \{ 5 + (3 \times 2) \}] \\
 & = [29 - (-2) \times 9] \div [3 \times \{ 5 + 6 \}] \\
 & = [29 + 18] \div [3 \times 11] \\
 & = 47 \div 33 \\
 & = 1.42 \\
 & [29 - (-2) \{ 6 - (-3) \}] \div [3 \times \{ 5 + (-3) \times (-2) \}] = 1.42.
 \end{aligned}$$

Solution 13:

Solution-13 :-

- (i) Nine multiplied by the sum of two and five $\rightarrow 9(2+5)$
- (ii) Twelve divided by the sum of one and three $\rightarrow 12 \div (1+3)$
- (iii) Twenty divided by the difference of seven and two $\rightarrow 20 \div (7-2)$
- (iv) Eight⁽⁸⁾ subtracted from the product of two and three $\rightarrow 2 \times 3 - 8$
- (v) Forty divided by one more than the sum of nine and ten $\rightarrow [40 \div \{1 + (9+10)\}]$
- (vi) Two multiplied by one less than the difference of nineteen and six $\rightarrow 2 \times \{19-6\} - 1$