

# 1. Integers

## Exercise 1.1

### Solution 1:

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,

$$\begin{aligned} &(-15) \times 8 \\ &= -(15 \times 8) \\ &= -120. \end{aligned}$$

[The Product of two integers of opposite signs is equal to the additive inverse of the product of their absolute values]

(iii) we have,

$$\begin{aligned} &(-25) \times (-9) \\ &= +(25 \times 9) \\ &= 225 \\ &(-25) \times (-9) = 225 \end{aligned}$$

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

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

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

### Solution 2:

Solution-02:-

(i) we have,

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

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

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

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

### 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:

oq 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:-

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

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

$$\therefore \text{LHS} = \text{RHS}.$$

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,

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

(iii) we have,

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

(iv) we have

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

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

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

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

$$(viii) \frac{0}{-135} = 0$$

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.

$$\begin{aligned} 36 \div 6 + 3 &= 36 \div 6 + 3 \\ &= \frac{36}{6} + 3 \\ &= 136 \\ &= 19 \\ &= 4. \end{aligned}$$

**Solution 2:**

Solution - 02:-

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

**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:-

$$\begin{aligned}32 - (3 \times 6) + 4 &= 32 - 18 + 4 \\ &= 17 + 4 \\ &= 21.\end{aligned}$$

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:-

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

**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,

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

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

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

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

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

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

$$= 45 - [19]$$

$$= 45 - 19 = 26.$$

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

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:-

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

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

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

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

$$= 2550 - [180] \quad \{ 270 - (-60) = 270 + 60 = 330 \}$$

$$= 2550 - 180$$

$$= 2370$$

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

Solution 9:

Solution-09:-

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

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

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

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

$$= 4 + \frac{1}{5} \{ \frac{150}{5} \}$$

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

$$= 4 + 6 = 10$$

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

Solution 10:

Solution-10:-

we have,

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

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

$$= 22 - \frac{1}{4} \{ -5 - \frac{144}{16} \}$$

$$= 22 - \frac{1}{4} \{ -5 - 9 \}$$

$$= 22 - \frac{1}{4} \{ -14 \}$$

$$= 22 + \frac{14}{4}$$

$$= 22 + \frac{7}{2} = 22 + 3.5 = 25.5$$

$$\therefore 22 - \frac{1}{4} \{ -5 - (-48) \} \div (-16) = 25.5$$

Solution 11:

On applying the BODMAS rule, we get:

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

Solution 12:

Solution-12:-

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

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

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

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

$$= 33 \div 33$$

$$= 1$$

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

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 <sup>(8)</sup> 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  $\rightarrow 2 \times \{19-6\} - 1$

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