Integers

EXERCISE : 1.1

1

i) Ascending order is $-18, -9, -4, 0, 3, 8, 12$

ii) Descending orders is $12, 8, 3, 0, -4, -9, -18$

iii) From left, $-17, -14, -11, -7, -5, -3, 1, 4, 7, 9, 11$.

2 B is -6

D is -4

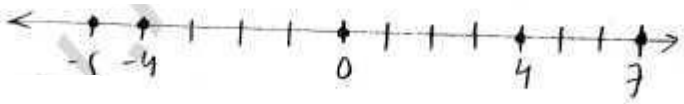
H is 0

J is 2

M is 5

O is 7.

3. Ascending order is $-5, -4, 0, 4, 7$.



4. Rohit scores in five successive rounds were $15, -3, -7, 12, 8$

Total score at end = Sum of all scores

$= 15 + (-3) + (-7) + 12 + 8$

$= 15 - 3 - 7 + 20 = 25$.

∴ Rohit Total score at end = 25

5. Ruchi deposited on Monday = ₹ 4370

She withdrew on Tuesday = ₹ 2875

on Tuesday, the money left = 4370 − 2875

= ₹ 1495

Next day i.e on wednesday

She deposited = ₹ 1550

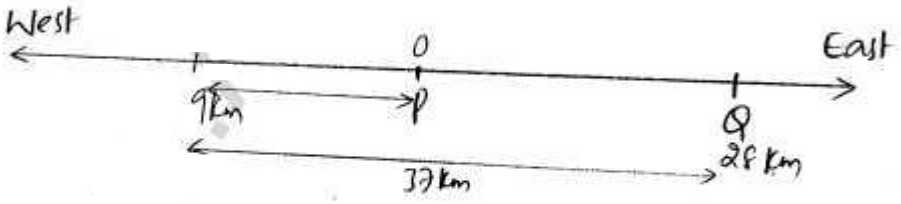
Total Money in bank = 1550 + 1495

= ₹ 3045

∴ Balance on Thursday = Balance on wednesday

= ₹ 3045

6



Final position from P is 28 − 37

= −9

7 Let the unfilled Boxes be 1st row 2nd Box be P

3rd Box be Q

2nd row 3rd Box be R

3rd row sequentially x, y, z

Given information all the sum of integers in each row, column and each diagonal is -6

i.e $-1+3+x=-6$; $-8+(-2)+Q=-6$

$2+x=-6$; $-8-2+Q=-6$

$x=-6-2$; $-10+Q=-6$

$x=-8$; $Q=-6+10=4$

$-1+P+4=-6$; $3+(-2)+R=-6$

$P+3=-6$; $1+R=-6$

$P=-6-3$; $R=-6-1$

$P=-9$; $R=7$

$-9+(-2)+y=-6$; $-8+5+z=-6$

$-11+y=-6$; $-3+z=-6$

$y=-6+11$; $z=-6+3$

$y=5$; $z=-3$

-1	P	Q
3	-2	R
x	y	z

$\Rightarrow$

-1	-9	4
3	-2	7
-8	5	-3

8

i) $|-13| - |9|$

We know $|-a| = a$

$= 13 - 9 = 4$

ii) $|13-5| - |-9|$

$= |8| - |-9|$

$= 8 - 9$

$= -1$

iii) $|35-21| - |8-3|$

$= |14| - |5|$

$= 14 - 5$

$= 9$

9.

Ascending order is $-102, -51, -39, -6, -5, 0, 7, 35$

10 Descending order is $4208, 139, 0, -31, -97, -203$.

11

i) True, it lies left to 0

ii) False, it will have predecessor & successor

iii) True,

iv) True

12

i) $(-11)+(-7)$; $(-11)-(-7)$

$= -11-7$; $(-11+7)$

$= -18$; -4

As $-18 < -4$

ii) $23-41+11$; $23-41-11$

$= 34-41$; $23-52$

$= -7$; -29

$\therefore -7 > -29$

iii) $40-(-39)+(-5)$; $40+(-39)-(-5)$

$= 40+39-5$; $40-39+5$

$= 79-5$; $1+5$

$= 74$; 6

$\therefore 74 > 6$

iv) $(-3)+13-(15)$; $25-(-2)+(-33)$

$-3+13-15$; $25+2-33$

$13-18$; $27-33$

-5 ; -6

$-5 > -6$

EXERCISE : 1.2

1

i) $-5, 2$ i.e $-5+2=-3$

$-6, 3$ i.e $-6+3=-3$

ii) $-2, 3$ i.e $-2-3=-5$ (vice versa not possible)

iii) $8, 4$ i.e $8-4=4$ (vice versa not possible

2

i) $-8, -13$

i.e $-8-(-13)$

$= -8+13$

$= 5$

ii) $-12, 4$

i.e $-12+4$

$= -8$

iii) $-1, 2$

i.e $-1-2=-3$

3. $-6, -8$

i.e $[-6-(-8)]$

$= -6+8 = 2$

4. A scored $-30, 20, 0$.

Total Team A Scored $= -30 + 20 + 0 = -10$.

Team B Scored 20, 0, −30.

Total Team B Scored $= 20 + 0 + (-30) = -10$

Scored by Team A and B are same $= -10$, Yes.

5. Sum $= -72 + 237 + 84 + 72 + (-184) + (-37)$

$= -72 + 393 - 184 - 37$

$= 393 - 293$

$= 100$

EXERCISE : 1.3.

1

(i) $7 \times (-35) = -245$

ii) $(-13) \times (-15) = 195$

iii) $(-12) \times (-11) \times (-10) = (-12) \times (110) = -1320$

iv) $(-13) \times 0 \times (-24) = 0$.

v) $(-1) \times (-2) \times (-3) \times (+4) = -24$

vi) $(-3) \times (-6) \times (-2) \times (-1) = 18 \times 2 = 36$.

2

i) $37 \times [6 + (-3)]$

If a, b, c are integers, then $a \times (b+c) = a \times b + a \times c$

$= 37 \times 6 + 37 \times (-3)$

$\therefore$ Both are equal, Verified

ii) $(-21) \times [(-6) + (-4)] = (-21) \times (-6) + (-21) \times (-4)$

If a, b, c are integers, then $a \times (b+c) = a \times b + a \times c$

$= (-21) \times (-6) + (-21) \times (-4)$

$\therefore$ Verified.

3.

i) $8 \times 53 \times (-125) = 8 \times (-125) \times 53$

$= -1000 \times 53$

$= -53{,}000$

ii) $(-8) \times (-2) \times 3 \times (-5) = (-8) \times (-5) \times (-2) \times 3$

$= 40 \times 6$

$= 240.$

iii) $(-6) \times 2 \times (-8) \times 5 = (-6) \times (-8) \times 2 \times 5$

$= 48 \times 10$

$= 480$

iv) $15 \times (-25) \times (-4) \times (-10) = 15 \times (-10) \times (-25) \times (-4)$

$= -150 \times 100$

$= -15{,}000$

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

$= (-48)[26 + (-36)]$

$= (-48)[26 - 36]$

$= (-48) \times (-10)$

$= 480.$

vi) $724 \times (-56) + (-724) \times 44.$

$= 724 \times (-56) + 724 \times (-44)$

$= 724 \times [-56 + (-44)]$

$= 724 \times [-56 - 44]$

$= 724 \times (-100)$

$= -72400$

vii) $(-47) \times 102 = (-47) \times (100 + 2)$

$= -47 \times 100 + (-47) \times 2$

$= -4700 + (-94)$

$= -4700 - 94$

$= -4794.$

viii) $(-39) \times (-97)$

$= (-39) \times (-100 + 3)$

$= (-39) \times (-100) + (-39) \times 3$

$= 3900 + (-117).$

$= 3900 - 117$

$= 3783$

4.

i) $(-4) \times x = 44$

$x = \frac{44}{-4} = \frac{44 \times -1}{-4 \times -1}$

$\boxed{x = \frac{-44}{4} = -11}$

ii) $7 \times \underline{\quad} = -42$

$$x = \frac{-42}{7}$$

$$x = -6.$$

iii) $\underline{\quad} \times (-13) = 143$

$$x = \frac{143}{-13} \times \frac{-1}{-1}$$

$$x = \frac{-143}{13}$$

$$\boxed{x = -11}$$

iv) $(-5) \times \underline{\quad} = 0.$

Any number multiplied with '0', we get 0.

So 0 is answer

i.e $-5 \times 0 = 0$.

5. For every one hour the temperature lowered at a rate of 5°c

For 8 hours it will be lowered by $5 \times 8 = 40°C$

Room temperature after freezing process $= 32 - 40$

$= -8°C$

6. Total number of questions = 10.

Marks given for Correct answer = 5 and

Marks given for incorrect answer = -2

i) Rohits gets 4 Correct and 6 incorrect answers

Rohit score = $4 \times 5 + 6 \times (-2) = 20 - 12 = 8$.

ii) Seema gets 5 Correct and 5 incorrect answers

Seema's score = $5 \times 5 + 5 \times (-2) = 25 - 10 = 15$

iii) As Rity attempted 7 questions and only 2 questions are Correct, So, number of incorrect questions are $7 - 2 = 5$.

Rity's score = $2 \times 5 + 5 \times (-2) = 10 - 10 = 0$.

7 i) Let pair of integers be x, y.

product is -15 ie $xy = -15$

$$y = \frac{-15}{x} \quad \text{---} (1)$$

Difference = 8

$$x - y = 8$$

From (1) $$x - \left(\frac{-15}{x}\right) = 8$$

$$\frac{x^2 + 15}{x} = 8$$

$$x^2 + 15 = 8x.$$

$$x^2 - 8x + 15 = 0$$

$$x^2 - 5x - 3x + 15 = 0$$

$$x(x-5) - 3(x-5) = 0$$

$$(x-3)(x-5) = 0$$

$$x = 3, \quad x = 9$$

$$y = \frac{-15}{3} \; ; \quad y = \frac{-15}{5}$$

$$y = -5 \; ; \quad y = -3$$

$\therefore$ The pair of integers are $3, -5$, $5, -3$.

Alternative method for (ii)

Product is -36

Difference is 15

We know

$$12 \times (-3) = -36 \; ; \; (-12) \times 3 = -36$$

$$9 \times (-4) = -36 \; ; \; (-9) \times 4 = -36$$

Thus, we have pair of integers $12, -3$; $-12, 3$; $9, -4$; $-9, 4$

such that product of each pair is -36.

But Difference of $9, -4 = 9 - (-4) = 9 + 4 = 13$ (N)

Difference of $-9, 4 = -9 - 4 = -13$.

Hence the required pairs are $12, -3$ or $-12, 3$.

EXERCISE : 1.4

1

(i) $(-36) \div (-9)$

$= +(36 \div 9) = +4$

$= 4$

(ii) $150 \div (-25)$

$= -(150 \div 25)$

$= -6$

(iii) $(-270) \div 27$

$= -(270 \div 27)$

$= -10$.

(iv) $(-59) \div (59)$

$= -(59 \div 59)$

$= -1$

(v) $0 \div (-19)$

$= 0$.

(vi) $(-784) \div (-56)$

$= +(784 \div 56)$

$= +14$

$= 14$

2.

i) $13 \div [(-2)+1]$

$= 13 \div [-2+1]$

$= 13 \div [-1]$

$= -[13 \div 1]$

$= -13$.

ii) $(-47) \div [(-45)+(-2)]$

$= (-47) \div [-45-2]$

$= (-47) \div (-47)$

$= +[47 \div 47]$

$= 1$

iii) $[(-6)+5] \div [(-2)+1]$

$= [-6+5] \div [-2+1]$

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

$= 1$

iv) $[(-48) \div (-6)] \div (-2)$

$= [+(48 \div 6)] \div (-2)$

$= [8] \div (-2)$

$= -[8 \div 2]$

$= -4$.

3. $(a \div b) \div c$

$= [(-225) \div 15] \div (-3)$

$= [-(225 \div 15)] \div (-3)$

$= (-15) \div (-3)$

$= +(15 \div 3)$

$= 5$

$a \div (b \div c)$

$= (-225) \div (15 \div (-3))$

$= (-225) \div (-(15 \div 3))$

$= (-225) \div (-5)$

$= +(225 \div 5)$

$= 45$

$5 \neq 45$

$\therefore$ Verified

4.

i) $a \div (b+c)$

$= (-10) \div (1+1)$

$= (-10) \div (2)$

$= -(10 \div 2)$

$= -5$

; $(a \div b) + (a \div c)$

$= (-10 \div 1) + (-10 \div 1)$

$= -10 + (-10)$

$= -10 - 10$

$= -20$

$-5 \neq -20$

$\therefore$ Verified

ii) $a \div (b+c)$

$= 12 \div (1+(-2))$

$= 12 \div (1-2)$

$(a \div b) + (a \div c)$

$= (12 \div 1) + (12 \div (-2))$

$= 12 + [-(12 \div 2)]$

$= 12 \div (-1)$; $12 + [-6]$

$= -(12 \div 1)$; $12 - 6$

$= -12$; 6

$-12 \neq 6$

$\therefore$ verified.

5. We know $a \div a = 1$ $-a \div a = -1$

i) $239 \div \underline{239} = 1$

ii) $(-85) \div \underline{85} = -1$

iii) $(-213) \div \underline{(-213)} = 1$

iv) $(-43) \div \underline{(-1)} = 43$

v) $\underline{(-84)} \div (-21) = 4$

vi) $(-66) \div \underline{22} = -3$

6. $a \div 5 = -3$

$\frac{a}{5} = -3 \Rightarrow a = -3b$

$b = 1$; $a = -3 \times 1 = -3$

$b = 2$; $a = -3 \times 2 = -6$

$b = 3$; $a = -3 \times 3 = -9$

$b = 4$; $a = -3 \times 4 = -12$

$b = 5$; $a = -3 \times 5 = -15$

∴ Five pairs are (-3, 1) (-6, 2) (-9, 3) (-12, 4) (-15, 5)

7.

i) Marks scored for 14 correct answers = 14 × 3 = 42

Sachin's score = 24.

∴ Marks obtained for incorrect answers = -42 + 24
= -18.

∴ The number of incorrect answers = (-18) ÷ (-2)
= 9.

ii) Marks scored for 9 correct answers = ~~9x3~~ = 9 × 3
= 27

Nalini's score = -7

∴ Marks obtained for incorrect answers = -7 - 27
= -34

Mark given for one incorrect answer = -2.

∴ The number of incorrect answers = (-34) ÷ (-2)
= 34 ÷ 2
= 17

8. Elevator descends at a rate of 6 m/min.

Descend starts from 10 m above ground level.

It has to reach the shaft 350 m below ground level

Total 360 m it has to reach

$$\text{Time} = \frac{\text{Distance}}{\text{Speed}}$$

$$= \frac{360}{6}$$

$$= 60 \text{ min}$$

$\therefore$ Time = 1 hour

$\therefore$ It will take 1 hour to reach the shaft

EXERCISE : 1.5

1. $7 - 8 \div (-2) + 3 \times (-4)$

According to BODMAS rule

$= 7 - (-4) + 3 \times (-4)$

$= 7 + 4 + (-12)$

$= 11 - 12$

$= -1$

2. $9 - \{7 - 24 \div (8 + 6 \times 2 - 16)\}$

$= 9 - \{7 - 24 \div (8 + 12 - 16)\}$

$= 9 - \{7 - 24 \div (4)\}$

$= 9 - \{7 - 6\}$

$= 9 - 1$

$= 8$

3. $-11 - [-6 - \{3 - 5(8 \div 4 - 1)\}]$

$= -11 - [-6 - \{3 - 5(2 - 1)\}]$

$= -11 - [-6 - \{3 - 5(1)\}]$

$= -11 - [-6 - \{3 - 5\}]$

$= -11 - [-6 - (-2)]$

$= -11 - [-6 + 4]$

$= -11 - (-2)$

$= -11 + 2$

$= -9$.

4. $(-3) \times (-12) \div (-4) + 3 \times 6$

$= (-3) \times 3 + 3 \times 6$

$= (-3) \times 3 + 18$

$= -9 + 18$

$= 9$

5 $14 \div (3(2-3+4)) - 9(5-3)$

$= 14 \div (6-9+12) - 45 + 27$

$= 14 \div (9) - 18$

$= \frac{14}{9} - 18$