DEPARTMENT OF EDUCATION (S)
Government of Manipur

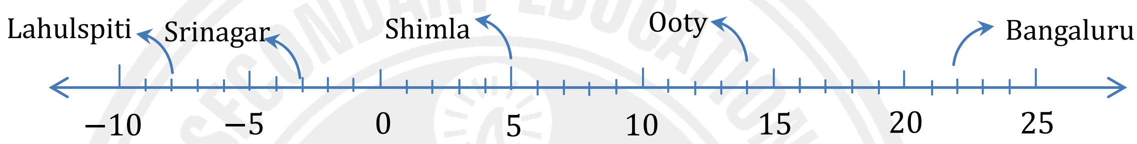
CHAPTER 1

INTEGERS

SOLUTIONS:

EXERCISE 1.1

1. **Following number line shows the temperature in degree Celsius (0°C) at different places on a particular day.**



(a) Observe this number line and write the temperature of the places marked on it.

Ans: i) Lahulspiti : – 8°C

ii) Srinagar : – 2°C

iii) Shimla : 5°C

iv) Ooty : 14°C and

v) Bengaluru : 22°C.

b). What is the temperature difference between the hottest and the coldest places among the above?

Ans : From the above number line we see that the hottesttemperature is Bengaluru 22°C and the coldest place is Lahulspiti– 8°C and their differences is 22°C – (– 8) = 22°C + 8°C

=30°C.

c). What is the temperature difference between Lahulspiti and Srinagar?

Ans. The temperature of Lahulspitiis –8°C and Srinagar is – 2°C

Now, their difference is –8°C –(– 2°C)

= –8°C + 2°C

= –6°C.

(d). Can we say temperature of Srinagar and Shimla taken together is less than the temperature at Shimla? Is it also less than the temperature at Srinagar?

Ans : Yes, the temperature of Srinagar and Shimla together is

– 2℃ + 5℃ = 3℃ which is less than that at Shimla (5℃) i,e. 5℃ > 3℃

No it is not less than the temperature at Srinagar, 3℃ > –2℃

[**NOTE: All positive integers are greater than negative integers**.]

Q.2.Sol^{n}: The scores of Jack in the quiz are $25 - 5 - 10 + 15 + 10$

$= (25 + 15 + 10) + (-10 - 5) = 50 - 15 = 35.$

Q.3. Sol^{n}:Temperature of Srinagar on Monday is – 5℃ , on Tuesday it dropped by 2℃ . So the change is – 2℃.

Temperature of Srinagar on Tuesday is (–5℃ – 2℃) = – 7℃
On Wednesday it rose by 4^{o}C. So the change is + 4℃
Temperature of Srinagar on Wednesday is(–7℃ + 4℃) = – 3℃.

Q4. Sol: The distance between plane and sea level is 5000m (above) and the distance between sea level and submarine is 1200m (below).

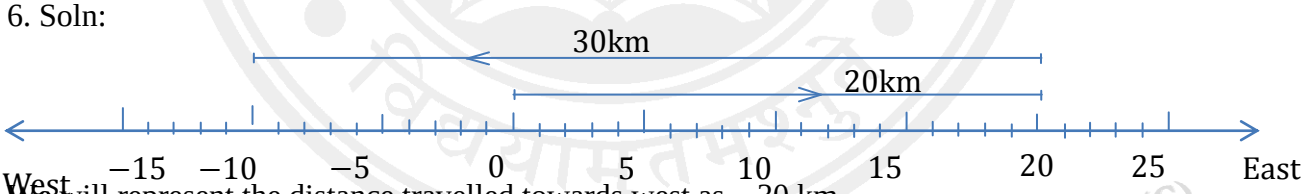
Therefore, the total distance between plane and submarine is
(5000 + 1200)m =6200m.

Q5. Ans : The amount deposited by Mohan is ₹ 2000.

If, he withdrew ₹1,642.

Then the remaining balance of Mohan's account is₹(2000 – 1642) = ₹ 358.

6. Soln:



We will represent the distance travelled towards west as – 30 km

Then, Rita goes + 20 km in the east.

And goes – 30 km in the west

Now her final position is +20 km – 30 km =– 10 km.

7. Soln:

5	–1	–4	
–5	–2	7	(i)
0	3	–3	

1	–10	0	
–4	–3	–2	(ii)
–6	4	– 7	

(i) (ii)

Row1:	5– 1– 4 =5–5 = 0	Row1 :	1– 10+0	= –9
Row2:	–5 –2 + 7 = –7+7=0	Row2:	–4 – 3 – 2	= –9
Row3 :	0+ 3– 3 =0	Row3:	–6 +4 – 7	= –9
Column1:	5- 5+ 0 = 0	Column1:	1–4 –6	= –9
Column2:	–1 – 2 + 3 =–3+3= 0	Column2:	–10 – 3 + 4	= –9
Column3:	–4 + 7 – 3 = 7–7=0	Column3 :	0 – 2 – 7	= –9
Diagonal1:	5 – 2 – 3 = 5–5=0	Diagonal1:	–6 – 3 + 0	= –9
Diagonal2:	– 4 – 2 + 0 =–6	Diagonal2:	1 – 3 –7 = 1–10 = –9	

Therefore, the given (i) is not a magic square whereas (ii) is a magic square.

8. Verify $a-(-b)=a+b$for the following values of $a$and b.

(i) $a=21, b=18$

Soln:- Now, $a-(-b)=a+b$

LHS $= a-(-b)$
$= 21-(-18)$
$= 21+18$
$= 39$

RHS$= a+b$
$= 21+18$
$= 39$

Therefore, LHS = RHS. Hence verified.

(ii) $a=118,\ b=125$

soln, Now, LHS$= a-(-b)$

, $= 118-(-125)$
$= 118+125$
$= 243$

RHS$= a+b$
$= 118+125$
$= 243$

Therefore, LHS=RHS, Hence verified.

(iii) $a = 75, b = 84$

Soln: Now, LHS= $a - (-b)$

$= 75 - (-84)$

$= 75 + 84$

$= 159$

RHS= $a + b$

$= 75 + 84$

$= 159$

Therefore, LHS=RHS, Hence verified

(iv) $a = 28, b = 11$

Soln: Now, LHS= $a - (-b)$

$= 28 - (-11)$

$= 28 + 11$

$= 39$

RHS= $a + b$

$= 28 + 11$

$= 39$

Therefore, LHS = RHS, Hence verified.

9. Use the sign of >,< or = in the box to make the statement to make the statements true.

Soln:

(a). $(-8) + (-4)$ $\boxed{<}$ $(-8) - (-4)$

(b). $(-3) + 7 - (19)$ $\boxed{<}$ $15 - 8 + (-9)$

(c). $23 - 41 + 11$ $\boxed{>}$ $23 - 41 - 11$

(d). $39 + (-24) - (15)$ $\boxed{<}$ $36 + (-52) - (-36)$

(e) $-231 + 79 + 51$ $\boxed{>}$ $-399 + 159 + 81$

10. Soln:

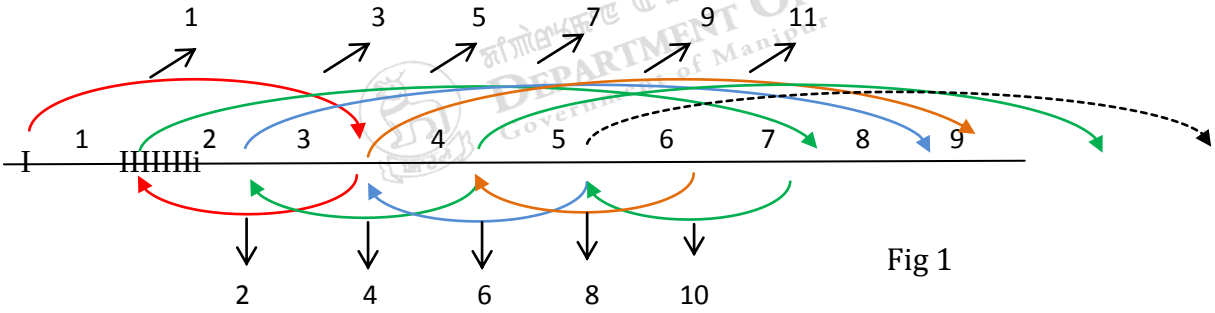


Fig 1

a) The monkey can reach the water leve lin 11 jumps.

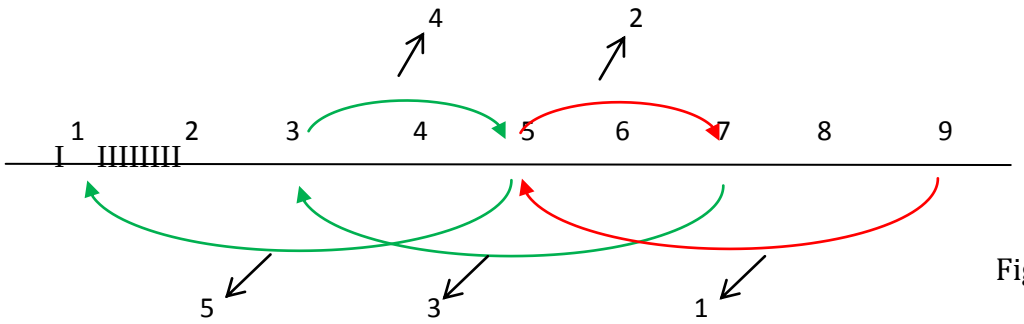


Fig 2

(ii) The monkey can reach the top step in 5 steps.

(iii) (a) $-3+2-3+2-3+2-3+2-3+2-3=-8$ steps downward.

(b) $4-2+4-2+4=8$

The sum 8 in (b) will represent going up by eight steps.

EXERCISE 1.2

1. Write down a pair of integers whose

(a) sum is – 7 (b) difference is – 10 (c) sum is 0.

Ans:

(a)– 5and – 2

Since, $-5+(-2)=-7$

(b) -8 and 2

Since, $-8-2=-10$

(c) $-7$and 7

Since, $-7+7=0$

2. (a) Write a pair of negative integers whose difference gives 8.

(b) Write a negative integer and a positive integer whose sum is– 5.

(c) Write a negative integer and a positive integer whose difference is –3.

(a). Ans : The two integers are -8 and -16

Then, $-8-(-16)=-8+16=8$.

(b). Ans : The two integers are $-10$and 5

Then, $-10+5=-5$.

(c). Ans : The two integers are -1 and 2

Then, $-1-2=-3$.

3. Ans : Score of team A $=-40+10+0=-30$

Score of team B $=10+0-40=-30$

The two teams had same score.

Yes, we can say that we can add integers in any order.

4. Fill in the blanks to make the following statements true:

(i) $(-5)+(-8)=(-8)+(-5)$

(ii) $-53+0=-53$

(iii) $17+(-17)=0$

(iv) $[13+(-12)]+(-7)=13+[(-12)+(-7)]$

(v) $(-4)+[15+(-3)]=[-4+15]+(-3)$

EXERCISE 1.3

1. Find each of the following products.

Soln:

(a) $3 \times (-1) = -3$
(b) $(-1) \times 255 = -255$
(c) $(-21) \times (-30) = 630$
(d) $(-316) \times (-1) = 316$
(e) $(-15) \times 0 \times (-18) = 0$
(f) $(-12) \times (-11) \times (10) = 1320$
(g) $9 \times (-3) \times (-6) = 162$
(h) $(-18) \times (-5) \times (-4) = -360$
(i) $(-1) \times (-2) \times (-3) \times 4 = -24$
(j) $(-3) \times (-6) \times (-2) \times (-1) = 36$

2. Verify the following.

(a) Soln : L.H.S $= 18 \times [7 + (-3)]$ R.H.S $= [18 \times 7] + [(18) \times (-3)]$

$= 18 \times [7 - 3]$ $= 126 - 54$
$= 18 \times 4$ $= 72$
$= 72$

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

(b) Soln : L.H.S $= (-21) \times [(-4) + (-6)]$

$= (-21) \times [-4 - 6]$
$= -21 \times (-10)$
$= 210.$

R.H.S $= [(-21) \times (-4)] + [(-21) \times (-6)]$

$= 84 + 126$
$= 210$

L.H.S = R.H.S, Hence Verified.

3. Soln :

(i) $-1 \times a = -a$, for any integer$a$.

(ii) (a) $22 \times (-1) = -22$

Therefore the required number is 22

(b) $-37 \times (-1) = 37$

Therefore the required number is 22

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

Therefore the required number is 22

4. Soln : The pattern is:

$-1 \times 5 = -5$

$-1 \times 4 = -4$

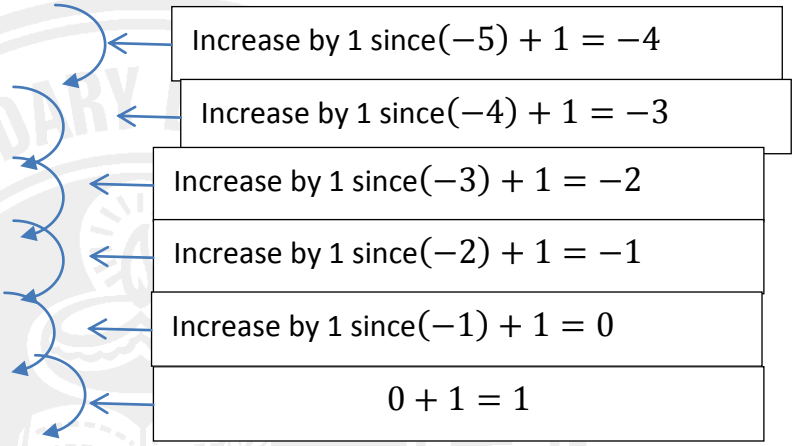
$-1 \times 3 = -3$

$-1 \times 2 = -2$

$-1 \times 1 = -1$

$-1 \times 0 = 0$

Hence, $-1 \times (-1) = 1$



5. Find the product using suitable properties:

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

$= (-48)\{26 + (-36)\}$ [distributive property]

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

$= 480.$

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

$= 53 \times 8 \times (-125)$ [commutative property]

$= 53 \times (-1000)$

$= -53000$

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

$= 15 \times (-10) \times (-25) \times (-4)$[rearranging the numbers using

$= (-150) \times 100$ commutative property]

$= -15000.$

d) Soln: $(-41) \times 102 = (-41)(100 + 2)$ [distributive property]

$= (-41) \times 100 + (-41) \times 2$

$= -4100 - 82$

$= -4182$

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

$= 625 \times (-35) - 625 \times 65$

$= 625 \times \{-35 - 65\}$ [distributive property]

$= 625 \times (-100)$

$= -62500.$

f) Soln: $7 \times (50 - 2) = 7 \times 50 - 7 \times 2$

$= 350 - 14$

$= 336.$

g) Soln: $-17 \times (-29) = -17 \times (-30 + 1)$

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

$= 510 - 17 = 493$

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

$= 57 \times 19 + 57$

$= 57 \times (19 + 1)$[distributive property]

$= 57 \times 20 = = 1140.$

6.Soln: The initial temperature of the room = 40℃

The temperature lowered in 1 hour is 5℃

i.e., thetemperature change in 1 hour is -5℃

The room temperature after 10 hours = $[40 + (-5) \times 10]$℃

$= [40 - 50]$℃

$= -10$℃.

7. Mark for each correct answer = 5

Mark for each wrong answer = -2

(i) Mohan gets four correct answer = $4 \times 5 = 20$ marks.

He gets six incorrect answers = $6 \times (-2) = -12$ marks

Total score of Mohan in the test is $\{20 + (-12)\} = 8$marks.

(ii) Reshma gets five correct answer = $5 \times 5 = 25$ marks.

She gets five incorrect answers = $5 \times (-2) = -10$ marks

Total score of Reshma in the test is $\{25 + (-10)\} = 15$ marks.

(iii)Heena gets two correct answer = $2 \times 5 = 10$ marks.

She gets five incorrect answers = $5 \times (-2) = -10$ marks

Total score of Heena in the test is $(10 - 10) = 0$ mark.

8. (a) Sol^{n}:

Profit for selling of 3000 bags of white cement = ₹ (3000 × 8)=₹ 24000.
And loss for selling of 5000 bags of grey cement = Rs (5000 x 5)
= ₹ 25000.
Here, loss > profit
Then the loss amount of the company is ₹(25000 – 24000) = ₹ 1000.

(b) Sol^{n}:

Loss for selling of 6,400 bags of grey cement = Rs(6400× 5)
= ₹ 32000
Therefore, the required number of white cement bag $=\frac{32000}{8}$
= 4000 bags.

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

Sol^{n}:

a. $(-3) \times (-\ 9) = 27$
b. $5 \times (-\ 7) = -35$
c. $7 \times (-8) = -56$
d. $-11 \times (-12) = 132$

EXERCISE 1.4

1. Evaluate each of the following:

Soln:

a. $-30 \div 10$

This is division of negative integer by a positive integer

Now, $\frac{30}{10} = 3$

$\therefore (-30) \div 10 = -3$ [by rule 1 above]

b. $50 \div (-5)$

This is division of positive integer by a negative integer

Now, $\frac{50}{5} = 10$

$\therefore 50 \div (-5) = -10$ [by rule 2 above]

c. $(-36) \div (-9)$

This is division of negative integer by a negative integer

d. Now, $\frac{36}{9} = 4$

$\therefore (-36) \div (-9) = 4$ [by rule 3 above]

e. $-49 \div 49 = -1.$

f. $13 \div [(-2) + 1] = 13 \div (-1) = -13.$

g. $0 \div (-12) = 0.$

h. $-31 \div [(-30) + (-1)] = -\frac{31}{-31} = 1.$

i. $[(-36) \div 12] \div 3 = [-3] \div 3 = -1.$

j. $[(-6) + 5] \div [(-2) + 1] = (-1) \div (-1) = 1.$

2. Verify that $a \div (b + c) \neq (a \div b) + (a \div c)$ or each of the following values of a, b and c.

Soln :

(a) $a = 12, b = -4$ and $c = 2.$

L.H.S = $a \div (b + c)$

$= 12 \div [(-4) + 2]$

$= 12 \div (-2)$

$= -6$

R.H.S = $(a \div b) + (a \div c)$

$= [12 \div (-4)] + [12 \div 2]$

$= -3 + 6$

$= 3$

Therefore, L.H.S $\neq$ R.H.S

(b) L.H.S = $-10 \div (1 + 1)$

$= -10 \div 2$

$= -5$

R.H.S = $[(-10) \div 1] + [(-10) \div 1]$

$= (-10) + (-10)$

$= -20$

Therefore, L.H.S $\neq$ R.H.S

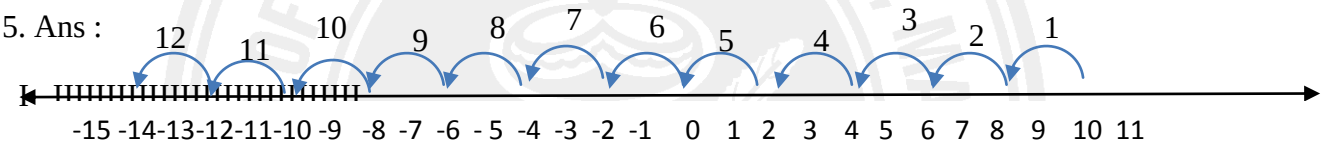
3. Fill in the blanks:

a. $369 \div 1 = 369$.
b. $(-75) \div 75 = -1$.
c. $(-206) \div (-206) = 1$.
d. $-87 \div (-1) = 87$.
e. $(-87) \div 1 = -87$.
f. $(-48) \div 48 = -1$.
g. $20 \div (-10) = -2$.
h. $(-12) \div 4 = -3$.

4. Soln :Five pairs of integer (a, b) such that $a \div b = -3$ are

(i)	$(9, -3)$	because $9 \div (-3) = -3$.
(ii)	$(-12, 4)$	because $-12 \div 4 = -3$
(iii)	$(15, -5)$	because $(15) \div (-5) = -3$
(iv)	$(-18, 6)$	because $-18 \div 6 = -3$
(v)	$(21, -7)$	because $21 \div (-7) = -3$

5. Ans :



The temperature will be $-8℃$ at 9 hours after 12 noon. i.e., at 9 p.m.

The temperature at midnight will be $-14℃$.

6. i).Marks scored by Radhika in 12 correct answers = $12 \times 3 = 36$ marks.

Marks for incorrect answers = $36 - 20 = 16$.
Therefore, number of incorrect answers = $\frac{16}{2} = 8$.

ii).Marks scored by Mohini in 7 correct answers = $7 \times 3 = 21$.

Her actual score is -5 marks.
Marks from incorrect answers = $21 - (-5) = 21 + 5 = 26$
Therefore, number incorrect answer = $\frac{26}{2} = 13$

7. The distance between 10m above the ground and 350m below the ground is $10 - (-350) = 10 + 350$ m = 360m.

Therefore, time taken to reach the ground = $\left(\frac{360}{6}\right)$min
= 60 min.

= 1 hour. [1 hour=60 min]