

# UNIQUE STUDY POINT

By Sumeet Sahu

[www.uniquestudyonline.com](http://www.uniquestudyonline.com)

Unique Study Point, Amitesh Nagar, Indore, MP | Contact: 8103405051

<b>Class:</b> VI	<b>Subject:</b> Mathematics	<b>Session:</b> 2025-26
<b>Chapter:</b> 10 - The Other Side of Zero (Integers)	<b>Time:</b> 1½ Hours	<b>Max. Marks:</b> 40

## General Instructions:

1. All questions are compulsory.
2. This question paper contains 20 questions divided into five sections A, B, C, D and E.
3. Section A contains 10 MCQs of 1 mark each.
4. Section B contains 4 questions of 2 marks each.
5. Section C contains 3 questions of 3 marks each.
6. Section D contains 1 question of 5 marks.
7. Section E contains 2 Case Study Based questions of 4 marks each.

## SECTION A - Multiple Choice Questions (1 mark each)

**Q.1** The additive inverse of +15 is:

- (a) +15
- (b) -15
- (c) 0
- (d) +1/15

**Q.2** Which of the following is the smallest integer?

- (a) 0
- (b) -1
- (c) -100
- (d) Does not exist

**Q.3** What is  $(+8) - (+15)$ ?

- (a) +7
- (b) -7
- (c) +23
- (d) -23

**Q.4** If you start from Floor 0 and go down 7 floors, you will be on Floor:

- (a) +7
- (b) -7
- (c) 0
- (d) +1

**Q.5** Which statement is correct?

- (a) Every integer has a successor
- (b)  $-20$  is greater than  $-15$
- (c) The sum of two negative integers is always positive
- (d) Zero is a positive integer

**Q.6** The value of  $(-11) + (-9)$  is:

- (a)  $+20$
- (b)  $-20$
- (c)  $+2$
- (d)  $-2$

**Q.7** Which integer comes exactly between  $-8$  and  $-6$ ?

- (a)  $-7$
- (b)  $0$
- (c)  $-14$
- (d)  $+1$

**Q.8** A submarine was at  $-80$  m. It rose  $30$  m. Its new position is:

- (a)  $-110$  m
- (b)  $-50$  m
- (c)  $+50$  m
- (d)  $+110$  m

**Q.9** According to Brahmagupta's rules, what is (negative)  $\times$  (negative)?

- (a) Positive
- (b) Negative
- (c) Zero
- (d) Cannot be determined

**Q.10** What is  $(-14) + (+14) - (+5)$ ?

- (a)  $+5$
- (b)  $-5$
- (c)  $0$
- (d)  $+33$

### SECTION B - Short Answer Questions (2 marks each)

**Q.11** Find two integers whose sum is  $-8$  and difference is  $4$ .

**Q.12** A plane is flying at an altitude of  $3000$  m above sea level. A submarine is  $500$  m below sea level. What is the vertical distance between them? Use integers.

**Q.13** Verify that:  $(-6) + (+10) = (+10) + (-6)$ . State the property used.

**Q.14** Using the number line, find the value of:  $(+5) - (+9)$

### SECTION C - Short Answer Questions (3 marks each)

**Q.15** A businessman has the following transactions in a week (using integers to represent profit and loss):

Day 1: Loss of ₹500  
Day 2: Profit of ₹800  
Day 3: Loss of ₹300  
Day 4: Profit of ₹600  
Day 5: Loss of ₹200

What is his net profit or loss for the week? Show all calculations.

**Q.16** On an unmarked number line, point A represents  $-3$  and point B represents  $+5$ . If point C is exactly halfway between A and B, what integer does point C represent? Explain your method.

**Q.17** The temperature at midnight was  $-7^{\circ}\text{C}$ . It rose by  $3^{\circ}\text{C}$  every hour for 4 hours. What was the temperature after 4 hours? Show the calculation step by step.

#### SECTION D - Long Answer Question (5 marks)

**Q.18** Answer the following based on the concept of zero pairs and the token model:

- Explain what a zero pair is with an example.
- Show using tokens how to calculate:  $(-5) + (+2)$
- Show using tokens how to calculate:  $(+4) - (+9)$ . Explain why you need to add zero pairs.
- If you have 7 positive tokens and 3 negative tokens, what integer do they represent together?
- How many zero pairs can you make from 5 positive and 8 negative tokens? What will be left over?

#### SECTION E - Case Study Based Questions (4 marks each)

##### Q.19 Case Study 1: Ocean Depths and Heights

The table shows the positions of different objects relative to sea level (0 m):

Object	Position (in meters)
Helicopter	+400
Boat	0
Scuba diver	-25
Submarine	-120

- What is the distance between the helicopter and the submarine? (1 mark)
- If the scuba diver descends 15 m more, at what position will they be? (1 mark)
- The submarine rises 50 m. What is its new position? (1 mark)
- Arrange all four objects in ascending order of their positions. (1 mark)

##### Q.20 Case Study 2: Bank Account Transactions

Rahul's bank account transactions for one week are shown below (deposits are positive, withdrawals are negative):

Day	Transaction (₹)
Monday	+2000 (deposit)
Tuesday	-800 (withdrawal)
Wednesday	+1500 (deposit)
Thursday	-1200 (withdrawal)

Friday	-300 (withdrawal)
--------	-------------------

His opening balance on Monday morning was ₹5000.

- (i) What is the total amount deposited during the week? (1 mark)
  - (ii) What is the total amount withdrawn during the week? (1 mark)
  - (iii) What is the net change in his account (using integers)? (1 mark)
  - (iv) What is his closing balance on Friday evening? (1 mark)
- 

Made with ♥ by Sumeet Sahu

Unique Study Point, Amitesh Nagar, Indore, MP

Website: [uniquestudyonline.com](http://uniquestudyonline.com)



SECTION A - Answers to MCQs

1. (b) -15

The additive inverse of a number is the number that when added to it gives zero.  $(+15) + (-15) = 0$

2. (d) Does not exist

Integers extend infinitely in the negative direction. There is no smallest integer. We can always find a smaller one.

3. (b) -7

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

4. (b) -7

Starting from 0, going down 7 floors:  $0 + (-7) = -7$

5. (a) Every integer has a successor

Every integer  $n$  has a successor  $n+1$ . Options (b), (c), and (d) are false.

6. (b) -20

When adding two negative integers, add their absolute values and keep the negative sign:  $(-11) + (-9) = -20$

7. (a) -7

Between  $-8$  and  $-6$ , the integer in the middle is  $-7$  (it's equidistant from both).

8. (b) -50 m

Initial:  $-80$  m, Rises  $30$  m:  $(-80) + (+30) = -50$  m

9. (a) Positive

According to Brahmagupta's rules: (negative)  $\times$  (negative) = positive

10. (b) -5

$$(-14) + (+14) - (+5) = 0 - (+5) = -5$$

SECTION B - Answers to Short Answer Questions

11. Answer: -2 and -6

Let the integers be  $x$  and  $y$ .

$$x + y = -8 \dots (1)$$

$$x - y = 4 \dots (2)$$

Adding equations:  $2x = -4$ , so  $x = -2$

Substituting in (1):  $-2 + y = -8$ , so  $y = -6$

**Verification:**  $(-2) + (-6) = -8$  ✓ and  $(-2) - (-6) = 4$  ✓

### 12. Answer: 3500 m

Plane position: +3000 m

Submarine position: -500 m

Distance = (+3000) - (-500) = +3000 + 500 = 3500 m

**The vertical distance is 3500 m**

### 13. Answer: Verified, Commutative Property

LHS:  $(-6) + (+10) = +4$

RHS:  $(+10) + (-6) = +4$

LHS = RHS

**Property used: Commutative Property of Addition**

(The order of adding integers does not change the sum)

### 14. Answer: -4

Using number line:

Start at +5

To subtract +9, move 9 steps to the left

$+5 \rightarrow +4 \rightarrow +3 \rightarrow +2 \rightarrow +1 \rightarrow 0 \rightarrow -1 \rightarrow -2 \rightarrow -3 \rightarrow -4$

**Answer:  $(+5) - (+9) = -4$**

## SECTION C - Answers to Short Answer Questions

### 15. Answer: Net profit of ₹400

Day 1: -500 (loss)

Day 2: +800 (profit)

Day 3: -300 (loss)

Day 4: +600 (profit)

Day 5: -200 (loss)

Total =  $(-500) + (+800) + (-300) + (+600) + (-200)$

=  $(+800 + 600) + (-500 - 300 - 200)$

=  $(+1400) + (-1000)$

= +400

**Net profit for the week is ₹400**

### 16. Answer: +1

Point A: -3

Point B: +5

Distance from A to B:  $(+5) - (-3) = 8$  units

Halfway point:  $8 \div 2 = 4$  units from A

Position of C:  $(-3) + (+4) = +1$

**Alternative method:**

Midpoint =  $(A + B) \div 2 = [(-3) + (+5)] \div 2 = 2 \div 2 = +1$

**Point C represents +1**

### 17. Answer: +5°C

Initial temperature: -7°C

**After 1 hour:**  $(-7) + (+3) = -4$ °C

**After 2 hours:**  $(-4) + (+3) = -1$ °C

**After 3 hours:**  $(-1) + (+3) = +2^{\circ}\text{C}$

**After 4 hours:**  $(+2) + (+3) = +5^{\circ}\text{C}$

**Alternative method:**

Total rise:  $3^{\circ}\text{C} \times 4 = 12^{\circ}\text{C}$

Final temperature:  $(-7) + (+12) = +5^{\circ}\text{C}$

**The temperature after 4 hours was  $+5^{\circ}\text{C}$**

## SECTION D - Answer to Long Answer Question

### 18. Zero Pairs and Token Model:

**(a) Zero pair explanation:**

A zero pair consists of one positive token (+) and one negative token (-) that cancel each other to make zero.

Example:  $(+1) + (-1) = 0$

When we have + and - together, they form a zero pair and can be removed.

**(b) Calculating  $(-5) + (+2)$  using tokens:**

Start with 5 negative tokens: - - - - -

Add 2 positive tokens: + +

Combined: - - - - - + +

Make zero pairs: Match 2 negative with 2 positive

Remaining: 3 negative tokens (- - -)

**Result:  $(-5) + (+2) = -3$**

**(c) Calculating  $(+4) - (+9)$  using tokens:**

Start with 4 positive tokens: + + + +

Need to remove 9 positive tokens, but we only have 4

**Add 5 zero pairs** (5 positive + 5 negative)

Now we have: + + + + + + + + - - - - -

Remove 9 positive tokens

Remaining: 5 negative tokens (- - - - -)

**Result:  $(+4) - (+9) = -5$**

**We needed zero pairs because we didn't have enough positive tokens to subtract**

**(d) 7 positive and 3 negative tokens:**

Make 3 zero pairs (matching 3 positive with 3 negative)

Remaining: 4 positive tokens

**They represent +4**

**(e) Zero pairs from 5 positive and 8 negative:**

We can make **5 zero pairs** (using all 5 positive with 5 negative)

**Left over: 3 negative tokens (representing -3)**

## SECTION E - Answers to Case Study Based Questions

### 19. Case Study 1: Ocean Depths and Heights

**(i) Distance between helicopter and submarine:**

Helicopter: +400 m

Submarine: -120 m

Distance =  $(+400) - (-120) = +400 + 120 = 520$  m

**(ii) Scuba diver's new position after descending 15 m:**

Current position: -25 m

Descends 15 m:  $(-25) + (-15) = -40$  m

**(iii) Submarine's new position after rising 50 m:**

Current position: -120 m

Rises 50 m:  $(-120) + (+50) = -70$  m

**(iv) Ascending order:**

Submarine (-120) < Scuba diver (-25) < Boat (0) < Helicopter (+400)

## 20. Case Study 2: Bank Account Transactions

**(i) Total amount deposited:**

Monday: +2000

Wednesday: +1500

Total deposits:  $+2000 + 1500 = ₹3500$

**(ii) Total amount withdrawn:**

Tuesday: -800

Thursday: -1200

Friday: -300

Total withdrawals:  $800 + 1200 + 300 = ₹2300$

**(iii) Net change in account:**

Net change =  $(+2000) + (-800) + (+1500) + (-1200) + (-300)$

=  $(+3500) + (-2300)$

= +1200

**Net increase of ₹1200**

**(iv) Closing balance:**

Opening balance: ₹5000

Net change: +1200

Closing balance:  $5000 + 1200 = ₹6200$

---

Made with ♥ by Sumeet Sahu

Unique Study Point, Amitesh Nagar, Indore, MP

Website: [uniquestudyonline.com](http://uniquestudyonline.com)