Integers

1 Learn the Skill

Integers include positive whole numbers (1, 2, 3, ...), their opposites or negative numbers (−1, −2, −3, ...), and zero. Positive numbers show an increase and may be written with or without a plus sign. Negative numbers show a decrease and are written with a negative sign. Integers can be added, subtracted, multiplied, and divided. There are specific rules for adding, subtracting, multiplying, and dividing integers.

In some cases, you may need to determine an integer's **absolute value**, or its distance from 0. Absolute values are always greater than or equal to zero, never negative. So the absolute value of both 9 and −9 is 9.

2 Practice the Skill

Many mathematics problems relating to real-world situations use integers. You must understand and follow the rules for adding, subtracting, multiplying, and dividing integers to solve such problems on the GED® Mathematical Reasoning Test. Read the examples and strategies below. Then answer the question that follows.

a If integers have like signs, add and keep the common sign. If integers have different signs, find the difference. Then use the sign of the number with the greater absolute value.

b To subtract an integer, add its opposite. For example, the opposite of −5 is +5.

c For multiplying or dividing integers: if the signs are the same, the answer will be positive. If the signs are different, the answer will be negative.

OPERATIONS WITH INTEGERS

Add Integers

$(+4) + (+7) = +11$ $(−5) + (−9) = −14$
$(−8) + (+4) = −4$ $(−5) + (+12) = +7$

Subtract Integers

$(+8) − (−5) = (+8) + (+5) = 13$
$8 − 5 = 8 + (−5) = 3$

Multiply and Divide Integers

$(4)(5) = +20$ $(−4)(5) = −20$
$(−4)(−5) = 20$ $(4)(−5) = −20$

$18 ÷ 9 = 2$ $(−18) ÷ 9 = −2$
$(−18) ÷ (−9) = 2$ $18 ÷ (−9) = −2$

TEST-TAKING TIPS

It may be helpful to use a number line when solving problems that involve integers. To solve 12−(−3), begin at −3 and count spaces to 12. You will see that the distance is +15.

-4 -2 0 2 4 6 8 10 12 14
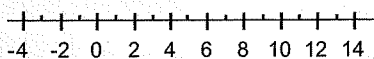
1. In the morning, the temperature was −3°F. By mid-afternoon, the temperature was 12°F. What was the change in temperature between the morning and afternoon?

   A. −15°F
   B. −9°F
   C. 9°F
   D. 15°F

★ Spotlighted Item: **FILL-IN-THE-BLANK**

DIRECTIONS: Read each question, and fill in your answer in the box below.

2. Uyen has a balance of $154 in her savings account. She withdraws $40 from a cash machine. What is her new balance?

3. In a board game, Dora moves forward 3 spaces, back 4 spaces, and forward again 8 spaces in one turn. What is her net gain or loss of spaces?

There were 3,342 students enrolled at a university. Of those students, 587 graduated in May. Over the summer, 32 students left the university, and 645 new students enrolled in the fall.

4. How many students were enrolled in the fall?

5. What is the change in the number of students enrolled between May and the following fall?

DIRECTIONS: Read each question, and choose the **best** answer.

6. Sasha's home is 212 feet above sea level. She participated in a scuba dive in which she descended to 80 feet below sea level. Which integer describes Sasha's change in position from her home to the lowest point of her dive?

   A. −292
   B. −132
   C. 132
   D. 292

DIRECTIONS: Study the number line, read the question, and choose the **best** answer.
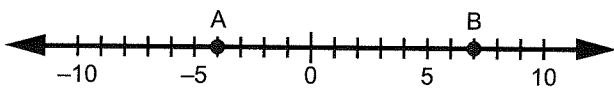
7. The absolute value of the difference between two numbers is the distance between the two numbers on the number line. What is the absolute value of the difference between points *A* and *B*?

   A. −11
   B. −3
   C. 3
   D. 11

DIRECTIONS: Study the information and table, read the question, and choose the **best** answer.

Melanie played a game and kept track of her score. The table shows her points earned for each round.

MELANIE'S POINTS SCORED

Round	Points Scored
1	8
2	−6
3	−4
4	3
5	4

8. What was Melanie's score at the end of Round 5?

   A. 25
   B. 15
   C. 7
   D. 5

9. Melanie played a sixth round and scored −8 in that round. What was her overall score?

   A. −13
   B. −3
   C. 13
   D. 18