Adding Integers

Name: _____	Date: _____	Score: _____ / 18

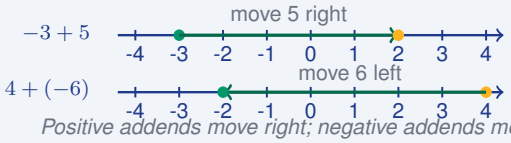
Think of adding integers as combining *movements* on a number line—or combining gains and losses in everyday life. Here is the key: when both numbers share the same sign, they move in the same direction, so you add the absolute values and keep that sign. When the signs are *different*, the numbers pull in opposite directions; you subtract the smaller absolute value from the larger one and keep the sign of whichever was stronger. You will also meet **zero pairs** (additive inverses), which show why a positive and its matching negative cancel out completely. Master these two rules and integer addition will feel natural every time.

Key Concepts & Quick Review

Same signs: Add the absolute values; keep the common sign. **Example:** $(-5)+(-8)=-(5+8)=-13$

Different signs: Subtract the smaller $|\cdot|$ from the larger; keep the sign of the larger $|\cdot|$. **Example:** $(-9)+4=-(9-4)=-5$

Additive inverse: $a+(-a)=0$ **Identity:** $a+0=a$



Positive addends move right; negative addends move left.

Examples

① Evaluate $(-13)+7$.

Think It Through: The signs are different, so subtract the smaller absolute value from the larger one. That gives $13-7=6$. Now decide the sign by looking at which number has the larger absolute value. Since 13 is larger than 7, the negative number wins. So the sum is -6.

Answer: -6

② A hiker starts at 240 feet above sea level, descends 380 feet, then climbs back up 95 feet. What is the hiker's final elevation?

Think It Through: Translate the changes into integers: $240+(-380)+95$. First combine 240 and -380. Because the signs are different, subtract $380-240=140$ and keep the sign of the larger absolute value, which is negative, so the result is -140. Then add 95: $-140+95=-45$. The final elevation is -45 feet, which means 45 feet below sea level.

Answer: -45 *feet*

Practice Problems

Find each sum.

1. $5 + (-8) =$ _____
2. $(-6) + (-9) =$ _____
3. $(-12) + 7 =$ _____
4. $(-3) + 15 =$ _____
5. $(-14) + (-6) =$ _____
6. $8 + (-8) =$ _____
7. $(-25) + 13 =$ _____
8. $(-9) + (-11) =$ _____
9. $17 + (-24) =$ _____
10. $(-30) + 45 =$ _____
11. $(-7) + (-7) + 4 =$ _____
12. $12 + (-5) + (-9) =$ _____
13. $(-20) + (-15) + 30 =$ _____
14. $(-6) + 13 + (-4) =$ _____
15. $36 + (-49) =$ _____

Study Tips

- When adding a long list of integers, group positives together and negatives together first; then combine the two totals.
- Opposite integers cancel: $(-7) + 7 = 0$. Look for zero pairs to simplify quickly.
- The sign of the answer matches the sign of the integer with the **larger** absolute value.

Word Problems

16. During a single football drive, a team gains 14 yards on the first play, loses 19 yards on the second play, gains 8 yards on the third play, and loses 6 yards on the fourth play. Write an addition expression using integers to represent the total yardage change, and then find the result. Is the team ahead of or behind their starting position, and by how many yards?

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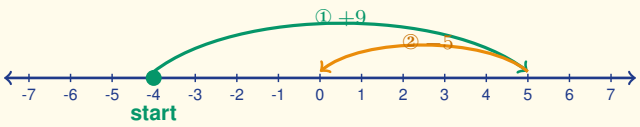
17. Kenji starts the week with \$$15$ in his account. He deposits \$$30$ on Monday, withdraws \$$48$ on Tuesday, deposits \$$12$ on Wednesday, and withdraws \$$22$ on Thursday. Write his balance after each transaction as an addition expression, and determine whether his account is positive or negative at the end of Thursday. If negative, how much does he owe?

_____

18. This number line shows two "jumps." The bug starts at -4, hops $+9$ along arrow ①, and then hops -5 along arrow ②. Write the addition expression for the bug's final position and find where the bug lands.



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Answer Keys

1) -3
2) -15
3) -5
4) 12
5) -20
6) 0
7) -12
8) -20
9) -7
10) 15
11) -10
12) -2
13) -5
14) 3
15) -13
16) -3; behind by 3 yards
17) -13; he owes $13
18) 0; bug lands at 0

Step-by-Step Explanations

Strategy: For Adding Integers, think of positives and negatives as opposite directions; same signs combine, different signs compete, and the larger distance wins. This integer-addition routine keeps the work readable and makes small mistakes easier to catch.

Practice 1: $5 + (-8) =$ **Answer:** -3
In the first example, combine positive and negative movements, then keep the sign of the side with the larger distance from zero.

Practice 15: $36 + (-49) =$ **Answer:** -13
Toward the end, combine positive and negative movements, then keep the sign of the side with the larger distance from zero.

Word-problem notes:

16. Answer: $14 + (-19) + 8 + (-6) = -3$; behind by 3 yards.
Write the total change as $14 + (-19) + 8 + (-6)$. Group the gains and losses to make it easier: gains are $14 + 8 = 22$, and losses are $-19 + (-6) = -25$. Then combine them: $22 + (-25) = -3$. A negative result means the team is 3 yards behind where it started.

17. Answer: $15 + 30 + (-48) + 12 + (-22) = -13$; he owes $\$13$.
Track the balance step by step. Starting at 15, after depositing 30 he has 45. Then $45 + (-48) = -3$, so the account goes negative. Next $-3 + 12 = 9$, and finally $9 + (-22) = -13$. A balance of $-\$13$ means Kenji owes $\$13$.

18. Answer: $(-4) + 9 + (-5) = 0$; bug lands at 0.
Translate the jumps into an addition expression: starting at -4, hopping $+9$, then hopping -5 gives $(-4) + 9 + (-5)$. Combine left to right: $-4 + 9 = 5$, and $5 + (-5) = 0$. So the bug lands exactly at 0.

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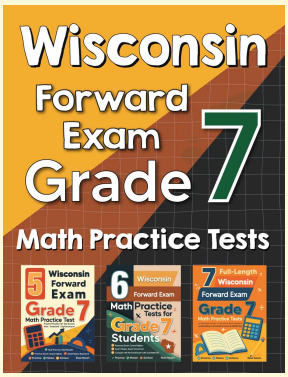

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