Adding Integers

Apply the skill to decisions and designs

Name _____ **Date** _____ **Score** _____ / 10

QUICK REVIEW

Add numbers with the same sign by adding magnitudes and keeping the sign. With opposite signs, subtract magnitudes and keep the sign of the larger magnitude. $-8+5=-3$. For fractions, first use a common denominator: $-3/10+1/2=1/5$.

Worked example

Evaluate $(-3)+(2)$. Show an exact fraction or integer.

1. Use denominator 1: $-3=-3/1$ and $2=2/1$.
2. Combine the signed numerators: $-3+(2)=-1$.
3. The value is $-1/1=-1$.
Answer: -1.

Practice Problems

Show your thinking.

1. Weather station: a signed model gives $(-7)+(3)$ meters. Find the signed result and interpret a negative result as below the reference level.

2. Balance log: plan A changes a balance by $(5)+(-9)$ dollars; plan B changes it by -6 dollars. Which leaves a larger balance from the same start, and by how much?

3. Sensor calibration: an unknown first reading combined with (-2) by the operation $+$ gives -8. Recover the first reading.

4. Target design: choose x so that $[(8)+(-4)]+x=7$. Determine x and verify the target.

5. Spending plan: the signed change is $(-3)+(7)$ dollars. Starting at 14 dollars, find the final balance.

6. Snow-depth log: one day's signed change is $(4)+(-6)$ cm. Find the total change over 3 identical days.

7. Water record: a signed volume change is $(-8)+(5)$ liters. Compare with a target change of -2 liters and find the gap.

8. Elevation log: two readings are 0 and $(9)+(-3)$ meters. Find the second reading and its distance from zero.

9. Freezer log: plan A changes a balance by $(-14)+(9)$ dollars; plan B changes it by -7 dollars. Which leaves a larger balance from the same start, and by how much?

10. Credit adjustment: choose x so that $[(17)+(-8)]+x=12$. Determine x and verify the target.

Answer Key

1. -4 meters; below the reference level.
2. Plan A by 2 dollars.
3. -6.
4. $x = 3$.
5. 18 dollars.
6. -6 cm.
7. Signed change -3 liters; 1 liter below target.
8. Reading 6 m; distance 6 m.
9. Plan A by 2 dollars.
10. $x = 3$.

Step-by-Step Solutions

Follow each calculation, then check your own work.

Problem 1

1. Use denominator 1: $-7 = -7/1$ and $3 = 3/1$.
2. Combine the signed numerators: $-7 + (3) = -4$.
3. The value is $-4/1 = -4$.

Problem 2

1. Use denominator 1: $5 = 5/1$ and $-9 = -9/1$.
2. Combine the signed numerators: $5 + (-9) = -4$.
3. The value is $-4/1 = -4$.
4. $-4 - (-6) = 2$ dollars.

Problem 3

1. Subtract the known addend from the sum.
2. $x = (-8) - (-2) = -6$.
3. Check in the original: $(-6) + (-2) = -8$.

Problem 4

1. Use denominator 1: $8 = 8/1$ and $-4 = -4/1$.
2. Combine the signed numerators: $8 + (-4) = 4$.
3. The value is $4/1 = 4$.
4. $x = 7 - (4) = 3$; check $4 + 3 = 7$.

Problem 5

1. Use denominator 1: $-3 = -3/1$ and $7 = 7/1$.
2. Combine the signed numerators: $-3 + (7) = 4$.
3. The value is $4/1 = 4$.
4. Final $= 14 + (4) = 18$ dollars.

Problem 6

1. Use denominator 1: $4 = 4/1$ and $-6 = -6/1$.
2. Combine the signed numerators: $4 + (-6) = -2$.
3. The value is $-2/1 = -2$.
4. Three days: $3(-2) = -6$ cm.

Problem 7

1. Use denominator 1: $-8 = -8/1$ and $5 = 5/1$.
2. Combine the signed numerators: $-8 + (5) = -3$.
3. The value is $-3/1 = -3$.
4. Gap: $-2 - (-3) = 1$ liter.

Problem 8

1. Use denominator 1: $9 = 9/1$ and $-3 = -3/1$.
2. Combine the signed numerators: $9 + (-3) = 6$.
3. The value is $6/1 = 6$.
4. Distance $= |6 - 0| = 6$ m.

Problem 9

1. Use denominator 1: $-14 = -14/1$ and $9 = 9/1$.
2. Combine the signed numerators: $-14 + (9) = -5$.
3. The value is $-5/1 = -5$.
4. $-5 - (-7) = 2$ dollars.

Problem 10

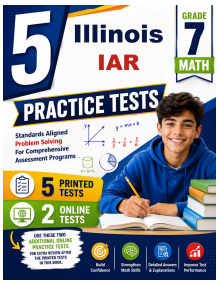
1. Use denominator 1: $17 = 17/1$ and $-8 = -8/1$.
2. Combine the signed numerators: $17 + (-8) = 9$.
3. The value is $9/1 = 9$.
4. $x = 12 - (9) = 3$; check $9 + 3 = 12$.

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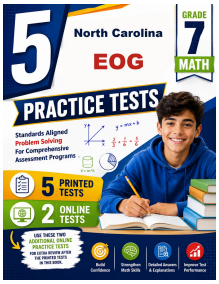
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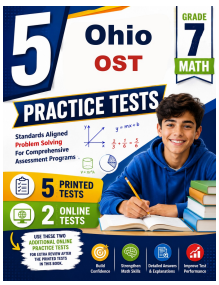
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