Adding Integers

Spot mistakes, reason, and work backward

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. Morgan claims $(-7)+(3)=4$. Locate the sign error and give the correct value.

2. For $(5)+(-9)$, a student adds magnitudes and writes 14. Correct the operation as well as the value.

3. Reconstruct x from $x+(-2)=-8$. Check by substitution.

4. Test whether $((8)+(-4))+(-4)=0$. Show the numerical cancellation.

5. Find $(-3)+(7)$. Is the result strictly between -5 and 5?

6. In $[(4)+(-6)]-(4)$, a student skips the brackets and reports -2. Finish the missing subtraction.

7. Find x if $-x=(-8)+(5)$. Explain why the final sign must change.

8. Compare $2[(9)+(-3)]$ with $(9)+(-3)$. Find both and state their difference.

9. In $[(-14)+(9)]-(-14)$, a student skips the brackets and reports -5. Finish the missing subtraction.

10. Find x if $-x=(17)+(-8)$. Explain why the final sign must change.

Answer Key

1. -4, not 4.
2. -4.
3. $x = -6$.
4. Yes; the sum is 0.
5. 4; yes.
6. -6.
7. $x = 3$.
8. 12 and 6; first minus second 6.
9. 9.
10. $x = -9$.

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 $-4/1 = -4$.
4. The claim 4 differs from the computed value -4, so its sign is not correct.

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 $-4/1 = -4$.

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. $4 + (-4) = 0$.

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. Its magnitude is $4 < 5$, so $-5 < 4 < 5$.

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. The omitted step is $-2 - (4) = -6$.

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. $-x = -3$ gives $x = 3$; check $-(3) = -3$.

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. Double is $2(6) = 12$; difference $12 - (6) = 6$.

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. The omitted step is $-5 - (-14) = 9$.

Problem 10

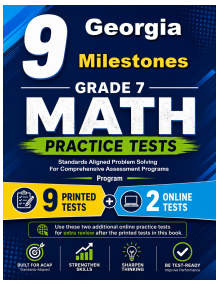
1. Use denominator 1: $17 = 17/1$ and $-8 = -8/1$.
2. Combine the signed numerators: $17 + (-8) = 9$.
3. The value is $9/1 = 9$.
4. $-x = 9$ gives $x = -9$; check $-(-9) = 9$.

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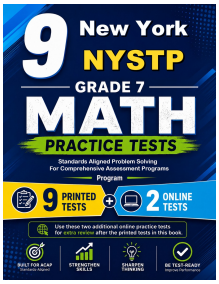
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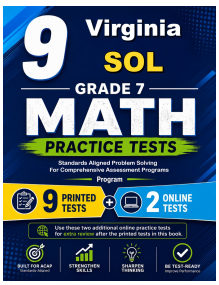
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