

Adding and Subtracting Integers: practice solutions, Grade 7 – download the PDF

Written solutions to the chapter problems. Check each step, then correct yourself.

1 Writing opposites



The opposite flips the sign: -9 , 14 , 0 (zero is its own opposite), -2.5 .

2 Absolute values



The absolute value is the distance from 0: $|-8| = 8$, $|5| = 5$, $|0| = 0$, $|-12| = 12$. Since $|-7| = 7$ and $|4| = 4$, $|-7|$ is larger.

3 Quick sums



(a) Same signs: $3 + 9 = 12$, so -12 . (b) $8 - 5 = 3$. (c) $10 - 6 = 4$, positive. (d) Opposites: 0. (e) $15 - 4 = 11$ with the sign of 15: -11 .

4 Quick differences



(a) $6 + (-10) = -4$. (b) $3 + 5 = 8$. (c) $-4 + (-7) = -11$. (d) $-2 + 9 = 7$. (e) $0 + 6 = 6$.

5 Morning warm-up



$-8 + 15 = 7$. Moving 15 right from -8 passes 0 after 8 steps and continues 7 more. The temperature is 7°F .

6 True or false?



(a) True: -3 is 3 units from 0. (b) True: $-(-6) = 6$. (c) False: signs differ, $5 - 2 = 3$, so the sum is -3 . (d) False: $4 - (-4) = 4 + 4 = 8$.

7 Reading the number line



A is at -6 , opposite 6, distance 6. B is at -2 , opposite 2, distance 2. C is at 3, opposite -3 , distance 3. D is at 5, opposite -5 , distance 5.

8 Submarine dive



After rising: $-45 + 18 = -27$. After diving: $-27 - 30 = -57$. The submarine is at -57 ft. In meters: $57 \times 0.3048 = 17.37 \dots \approx 17.4$ m, so about -17.4 m.

9 Distances



(a) $|5 - (-7)| = 12$. (b) $|-2 - (-9)| = |7| = 7$. (c) $|11 - 3| = 8$. (d) $|0 - (-4)| = 4$.

10 Bank account



$42 - 65 = -23$, then $-23 + 30 = 7$, then $7 - 12 = -5$. The balance is -5 dollars: the account is overdrawn by 5 dollars.

11 Missing numbers



(a) $-2 - (-6) = 4$. (b) $-10 + 7 = -3$. (c) $5 - 12 = -7$, check $5 - (-7) = 12$. (d) $1 + (-3) = -2$, check $-2 + 3 = 1$.

12 Find the error



She treated the problem as $-8 + 5$. But $-8 - 5 = -8 + (-5)$, and both numbers are negative, so we add the absolute values and keep the minus sign: -13 .

13 Trivia game



Running totals: 15 , $15 - 10 = 5$, $5 + 5 = 10$, $10 - 20 = -10$, $-10 + 10 = 0$. The final score is 0 . The lowest total, -10 , came after round 4.

14 The hiker



Distance: $340 - (-120) = 340 + 120 = 460$. She climbs 460 feet. Check: 120 ft up to sea level, then 340 ft more.

15 Rational numbers



(a) $4.75 - 2.5 = 2.25$, positive. (b) $-\frac{3}{4} + \frac{2}{4} = -\frac{1}{4}$. (c) $1.2 + 3.8 = 5$. (d) $-\frac{5}{6} + \frac{2}{6} = -\frac{3}{6} = -\frac{1}{2}$.

16 A long expression



Left to right: $-12 + 9 = -3$; $-3 - (-4) = 1$; $1 - 7 = -6$. Check: rewrite as $-12 + 9 + 4 + (-7)$. Positives: $9 + 4 = 13$. Negatives: $-12 - 7 = -19$. Then $13 + (-19) = -6$.

17 Two mystery integers

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Let the integers be x and y : $x + y = -3$ and $x - y = 11$. Adding both equations, $2x = 8$, so $x = 4$. Then $y = -3 - 4 = -7$. Check: $4 + (-7) = -3$ and $4 - (-7) = 11$.

18 Points at a given distance

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Move 9 right: $-4 + 9 = 5$. Move 9 left: $-4 - 9 = -13$. So Q is at 5 or at -13 . Check: $|5 - (-4)| = 9$ and $|-13 - (-4)| = |-9| = 9$.

19 Weather extremes

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(a) $5 - (-11) = 16$, so it fell 16 degrees. (b) Warmest 14, coldest -11 : $14 - (-11) = 25$. The gap is 25 degrees Fahrenheit.

20 Always, sometimes, never

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(a) Always: you move left twice, so you stay below 0. (b) Sometimes: $8 - 3 = 5$ is positive but $3 - 8 = -5$ is not. (c) Always: this is the additive inverse. (d) Sometimes: true for $a = 6$, false for $a = -6$ since $|-6| = 6 \neq -6$.

21 Elevator trip

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(a) $2 \rightarrow 2 - 5 = -3 \rightarrow -3 + 9 = 6 \rightarrow 6 - 7 = -1 \rightarrow 8$. (b) The last move is $8 - (-1) = 9$ floors up. Total travel: $5 + 9 + 7 + 9 = 30$ floors.

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Swapping the order

$a - b = -5 - 3 = -8$ and $b - a = 3 - (-5) = 8$. They are opposites. Both have absolute value equal to the distance between a and b (8 units), but the walk goes in opposite directions, so the signs differ: $b - a = -(a - b)$.

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