

Grade 7 · Adding and Subtracting Integers and Rational Numbers · Worksheet Answer Key

Common Core 7.NS.A.1a, 7.NS.A.1b, 7.NS.A.1c, 7.NS.A.1d · mathovore.fr

Each solution below shows the full work for the adding and subtracting integers worksheet, including the number line moves and the sign rules used. Compare your steps with these, and check that each answer has the correct sign and units.

Grade 7 Common Core: 7.NS.A.1a · 7.NS.A.1b · 7.NS.A.1c · 7.NS.A.1d

Problem 1: Opposites and Zero

The opposite of a number is the same distance from 0 on the other side.

- a. -9
- b. 15
- c. -2.5
- d. 0

Since $-23 + 23 = 0$, the missing number is 23.

Problem 2: Opposites in real life

- a. $+15$. The opposite is -15 : 15 ft below sea level.
- b. -9 . The opposite is 9: gaining \$9.
- c. -6 . The opposite is 6: the temperature rises 6°F .

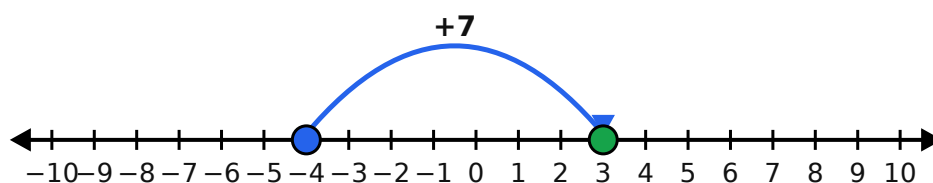
Opposites are the same distance from 0 on opposite sides.

(a) 15 and -15 . (b) -9 and 9. (c) -6 and 6.

Problem 3: Adding on a Number Line

Move right for a positive number and left for a negative number.

- a. $-4 + 7 = 3$
- b. $-4 + (-3) = -7$
- c. $-4 + 4 = 0$
- d. $-4 + (-6) = -10$



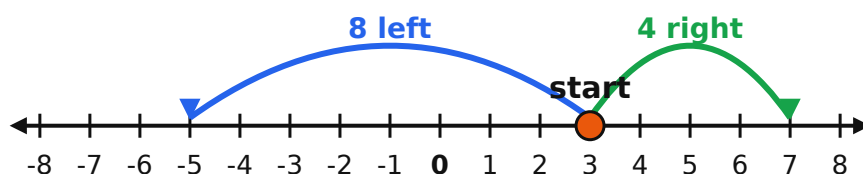
Part (a): $-4 + 7 = 3$.

Answers: **3, -7, 0, -10.**

Problem 4: Jumping from three

Adding a negative number moves left. Subtracting a positive number moves left. Subtracting a negative number moves right.

- a. $3 + (-8) = -5$
- b. $3 - 6 = 3 + (-6) = -3$
- c. $3 - (-4) = 3 + 4 = 7$



From 3: 8 units left reaches -5 ; 4 units right reaches 7.

(a) -5. (b) -3. (c) 7.

Problem 5: Adding Integers

- a. Different signs: $9 - 4 = 5$, keep the negative sign. $-9 + 4 = -5$.
- b. $11 - 6 = 5$, keep the negative sign. $6 + (-11) = -5$.
- c. Same signs: $7 + 5 = 12$, negative. $-7 + (-5) = -12$.
- d. Opposites: $15 + (-15) = 0$.
- e. $35 - 20 = 15$, positive. $-20 + 35 = 15$.

Answers: **-5, -5, -12, 0, 15.**

Problem 6: More sums of integers

- a. Same signs: $13 + 8 = 21$, so the sum is negative. $-13 + (-8) = -21$.
- b. Different signs: $17 - 6 = 11$, and 17 is larger, so the sum is positive. $17 + (-6) = 11$.
- c. $25 - 9 = 16$, and -25 is farther from 0, so the sum is negative. $-25 + 9 = -16$.
- d. Same signs: $4 + 19 = 23$. $-4 + (-19) = -23$.

e. $50 - 31 = 19$, and 50 is larger, so the sum is positive. $-31 + 50 = 19$.

$-21, 11, -16, -23, 19$

Problem 7: Subtracting Integers

- a. $9 + (-14) = -5$
- b. $-6 + (-8) = -14$
- c. $5 + 7 = 12$
- d. $-10 + 4 = -6$
- e. $0 + 13 = 13$

Answers: $-5, -14, 12, -6, 13$.

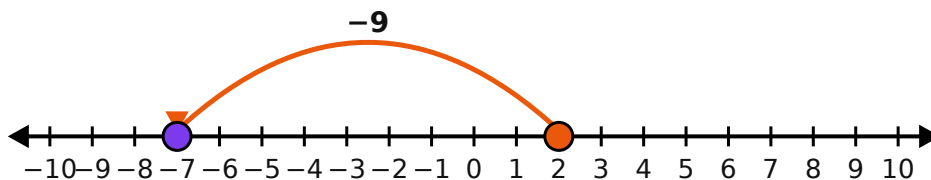
Problem 8: More differences

- a. $8 + (-15) = -7$
- b. $-12 + (-5) = -17$
- c. $7 + 9 = 16$
- d. $-14 + 14 = 0$
- e. $-20 + 35 = 15$

$-7, -17, 16, 0, 15$

Problem 9: Subtracting on a Number Line

- a. Subtracting 9 moves 9 units left: $2 - 9 = -7$.
- b. Subtracting -5 is adding 5: $2 - (-5) = 7$.
- c. $2 - 9 = 2 + (-9) = -7$.



Part (a): $2 - 9 = -7$.

Answers: $-7, 7, 2 + (-9)$.

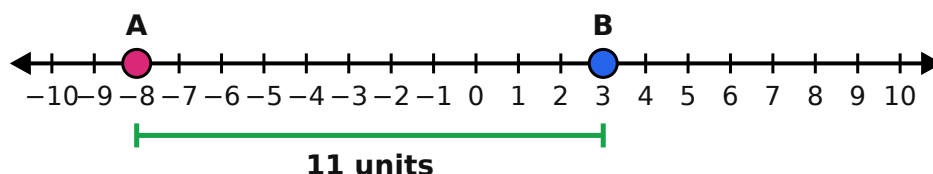
Problem 10: Three terms

- a. $-8 + 15 = 7$. Then $7 + (-12) = -5$.
- b. $6 - (-4) = 6 + 4 = 10$. Then $10 - 13 = -3$.
- c. $-7 - (-9) = -7 + 9 = 2$. Then $2 + (-3) = -1$.

(a) -5 . (b) -3 . (c) -1 .

Problem 11: Distance on a Number Line

- a. $|-8-3| = |-11| = 11$ units.
- b. $|-5-(-12)| = |7| = 7$ units.
- c. $|-4.5-2.5| = |-7| = 7$ units.
- d. $|-8-3| = |-11| = 11$ and $|3-(-8)| = |11| = 11$, so they are equal.

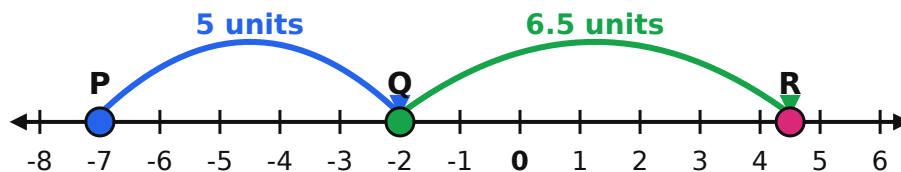


Distance $AB = 11$.

Answers: **11, 7, 7**, and both expressions equal 11.

Problem 12: Distances between points

- a. $|-7-(-2)| = |-5| = 5$ units.
- b. $|-2-4.5| = |-6.5| = 6.5$ units.
- c. $|-7-4.5| = |-11.5| = 11.5$ units. Check: $5+6.5=11.5$.
- d. $-7-3.5 = -10.5$.



Distances along the number line add up.

(a) **5 units.** (b) **6.5 units.** (c) **11.5 units.** (d) -10.5 .

Problem 13: Mixed number types

- a. $-1.25+3.5=2.25$. Then $2.25-(-2.75)=2.25+2.75=5$.
- b. Use sixths: $-\frac{5}{6}-\frac{2}{6}=-\frac{7}{6}$. Then $-\frac{7}{6}+\frac{3}{6}=-\frac{4}{6}=-\frac{2}{3}$.
- c. $1\frac{1}{2}=\frac{3}{2}=\frac{9}{6}$ and $-\frac{2}{3}=-\frac{4}{6}$. Distance: $\frac{9}{6}-(-\frac{4}{6})=\frac{13}{6}=2\frac{1}{6}$.

(a) **5.** (b) $-\frac{2}{3}$. (c) $2\frac{1}{6}$.

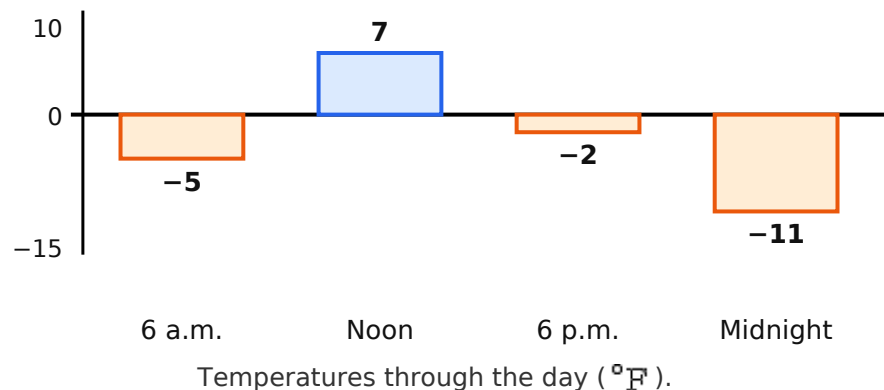
Problem 14: Fractions and Decimals

- a. $-\frac{3}{4} + \frac{2}{4} = -\frac{1}{4}$. Then $-\frac{1}{4} + \frac{5}{4} = \frac{4}{4} = 1$.
b. $-2.6 + 5.4 = 2.8$. Then $2.8 + (-1.8) = 1$.
c. $\frac{3}{2} = 1.5$, so the distance is $|-2.5 - 1.5| = |-4| = 4$.

Answers: **1, 1, 4.**

Problem 15: Temperature Change

- a. $-5 + 12 = 7$, so noon was 7°F .
b. $7 - 9 = -2$, so 6 p.m. was -2°F .
c. Change = final minus start: $-11 - (-2) = -11 + 2 = -9$. The temperature changed by -9°F , a drop of 9°F .



Problem 16: Golf scores

- a. Highest: 5 (Diego). Lowest: -4 (Priya). $5 - (-4) = 5 + 4 = 9$.
b. Ethan: 3. Aisha: -1 . $3 - (-1) = 3 + 1 = 4$.
c. $-1 - 4 = -1 + (-4) = -5$.

(a) 9 strokes. (b) 4 strokes. (c) -5 (5 strokes under par).

Problem 17: Yards gained and lost

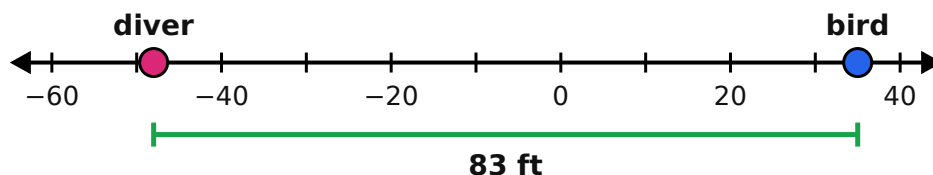
- a. Gains are positive and losses are negative: $7 + (-12) + 5 + (-9)$. $7 + (-12) = -5$, then $-5 + 5 = 0$, then $0 + (-9) = -9$. The net yardage is -9 yards.
b. The team needs to go from -9 to 10. $10 - (-9) = 10 + 9 = 19$.

Check: $-9 + 19 = 10$.

(a) -9 yards (a net loss of 9 yards). (b) 19 yards.

Problem 18: Elevation Differences

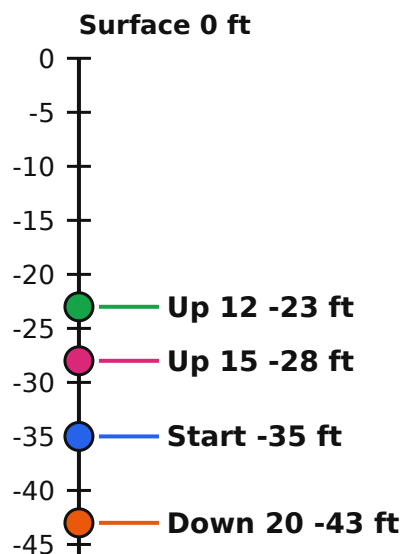
- a. $35 - (-48) = 83$, so 83 ft.
- b. $120 - (-48) = 168$, so 168 ft.
- c. $-48 + 30 = -18$, so -18 ft.
- d. $35 - (-18) = 53$, so the diver is 53 ft below the bird.



Distance between diver and bird: 83 ft.

Problem 19: Scuba dive

- a. Up 12: $-35 + 12 = -23$. Down 20: $-23 - 20 = -43$. Up 15: $-43 + 15 = -28$.
- b. The final elevation is -28 ft, which is 28 ft below the surface.
- c. $|-28 - (-35)| = |7| = 7$, so the distance is 7 ft.



The four stops of the dive.

(a) -23 ft, -43 ft, -28 ft. **(b)** 28 ft. **(c)** 7 ft.

Problem 20: Bank Balance

- a. After the check: $45.50 - 72.25 = -26.75$. After the deposit: $-26.75 + 30 = 3.25$. After the fee: $3.25 - 5.75 = -2.50$. Balances: -\$26.75, \$3.25, -\$2.50.
- b. Add the opposite of -2.50: \$2.50.

