

Grade 7 · Multiplying and Dividing Integers and Rational Numbers · Worksheet Answer Key

Common Core 7.NS.A.2a, 7.NS.A.2b, 7.NS.A.2c · mathovore.fr

Use this answer key to check each step of the multiplying and dividing integers worksheet. Every solution shows how the sign was chosen and how the absolute values were multiplied or divided, so you can find and fix any mistake.

Grade 7 Common Core: 7.NS.A.2a · 7.NS.A.2b · 7.NS.A.2c

Problem 1: Repeated Addition

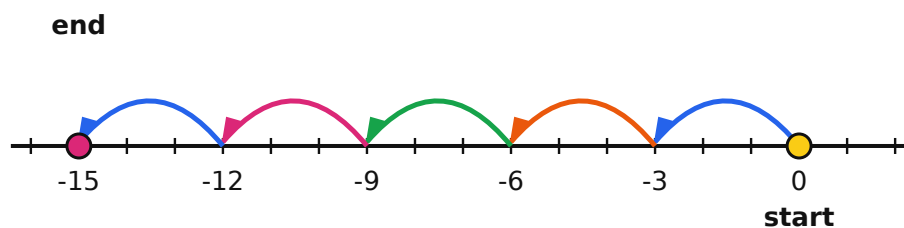
- a. Four jumps of -3 : $4 \times (-3) = -3 + (-3) + (-3) + (-3) = -12$.
- b. $5 \times (-2) = (-2) + (-2) + (-2) + (-2) + (-2) = -10$.

Answers: -12 , -10 .

Problem 2: Jumps of Negative Three

- a. There are 5 jumps, and each jump is -3 . $5 \times (-3) = (-3) + (-3) + (-3) + (-3) + (-3) = -15$.
- b. $3 \times (-5) = (-5) + (-5) + (-5) = -15$. Both products are -15 : the order of the factors does not change the product.

Answers: -15 ; -15 .



The jumps end at -15 .

Problem 3: Sign Rules for Products

- a. Different signs: $7 \cdot 6 = 42$, negative. -42 .
- b. Same signs: $5 \cdot 8 = 40$, positive. 40 .
- c. Different signs: -36 .
- d. Same signs: 36 .
- e. Zero times any number is 0 .

Answers: -42 , 40 , -36 , 36 , 0 .

Problem 4: Count the Negative Factors

- a. Three negative factors, so the product is negative. $2 \times 3 \times 4 = 24$. -24
- b. Four negative factors, so the product is positive. 1
- c. Two negative factors, so the product is positive. $5 \times 2 \times 3 = 30$. 30
- d. Five negative factors, so the product is negative. $2 \times 2 \times 2 \times 2 \times 2 = 32$. -32

Problem 5: A Pattern of Products

The products go up by 4 each time the factor goes down by 1.

Factor	3	2	1	0	-1	-2
$(-4) \times \text{factor}$	-12	-8	-4	0	4	8

The missing products are 4 and 8.

- a. $(-4)(-1) = 4$ and $(-4)(-2) = 8$.
- b. Each product increases by 4. The pattern continues into positive values, so a negative times a negative is **positive**.

Problem 6: Find the Missing Number

- a. $56 \div (-7) = -8$. Check: $-7 \times (-8) = 56$. -8
- b. $9 \times (-4) = -36$. Check: $-36 \div (-4) = 9$. -36
- c. $-45 \div 9 = -5$. Check: $-45 \div (-5) = 9$. -5
- d. $-54 \div (-6) = 9$. Check: $-6 \times 9 = -54$. 9

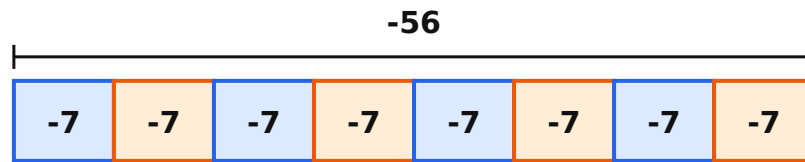
Problem 7: Dividing Integers

- a. Different signs: $48 \div 6 = 8$, so -8 .
- b. Same signs: $45 \div 9 = 5$, so 5.
- c. Different signs: -8 .
- d. Zero divided by a nonzero number is 0.
- e. Same signs: $90 \div 15 = 6$, so 6.

Answers: -8 , **5**, -8 , **0**, 6.

Problem 8: Tape Diagram for Division

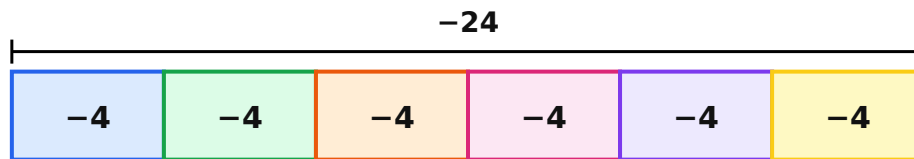
- a. $-56 \div 8 = -7$, so each part is -7 .
- b. $8 \times (-7) = -56$. It checks.
- c. $-56 \div (-7) = 8$. It tells how many parts of size -7 fit in -56 : **8 parts**.



Each of the 8 parts is -7 .

Problem 9: Division as Equal Parts

- $-24 \div 6 = -4$, so each part is -4 .
- $6 \times (-4) = -24$. It checks.
- $-35 \div 5 = -7$ because $5 \times (-7) = -35$.



Each part is -4 .

Answers: -4 , **checks**, -7 .

Problem 10: Division by Zero

- $0 \div 8 = 0$ because $8 \cdot 0 = 0$.
- $8 \div 0 = r$ would mean $0 \cdot r = 8$. Zero times any number is 0, so no number works. The quotient is **undefined**.
- The rule holds only when the divisor is nonzero. Dividing by 0 is never allowed, so $0 \div 0$ is also undefined.

Problem 11: Decimal Products and Quotients

- Different signs, so negative. $0.6 \times 0.9 = 0.54$. -0.54
- Same signs, so positive. $1.5 \times 4 = 6$. 6
- Same signs, so positive. $72 \div 8 = 9$. 9
- Different signs, so negative. $45 \div 9 = 5$. -5

Problem 12: Signs in Fractions

- $-\frac{12}{4} = -3$, $\frac{-12}{4} = -3$, $\frac{12}{-4} = -3$. All three are equal.
- $-\frac{-10}{2} = -(-5) = 5$ and $\frac{10}{2} = 5$.
- $\frac{20}{-5} = -\frac{20}{5} = -4$.

Answers: -3 (**all three**), **5 and 5**, -4 .

Problem 13: Fraction Products and Quotients

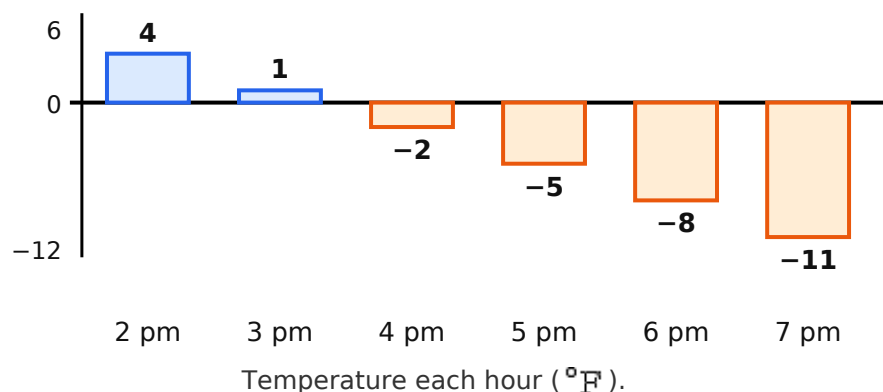
- a. Same signs, so positive. $\frac{5}{6} \times \frac{3}{10} = \frac{15}{60} = \frac{1}{4}$. $\frac{1}{4}$
b. Different signs, so negative. $\frac{2}{3} \times \frac{9}{4} = \frac{18}{12} = \frac{3}{2}$. $-\frac{3}{2}$
c. Same signs, so positive. $\frac{3}{4} \times \frac{8}{3} = \frac{24}{12} = 2$. 2

Problem 14: Powers and Order of Operations

- a. $(-2)(-2)(-2) = 4 \times (-2) = -8$. -8
b. $(-3)^2 = (-3)(-3) = 9$. $-(3^2) = -(9) = -9$. In the first, the base is -3 ; in the second, only 3 is squared and the negative sign is applied afterward. 9 **and** -9
c. Parentheses: $4 - 9 = -5$. Multiply and divide left to right: $-3(-5) = 15$ and $-20 \div 5 = -4$.
Add: $15 + (-4) = 11$. 11

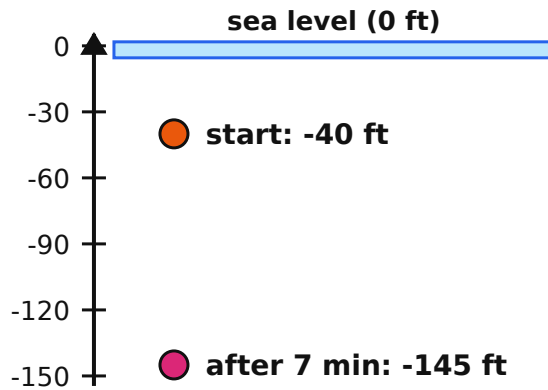
Problem 15: Falling Temperatures

- a. $5 \times (-3) = -15$. The total change is -15°F .
b. $4 + (-15) = -11$. The temperature at 7 p.m. is -11°F .



Problem 16: Submarine Dive

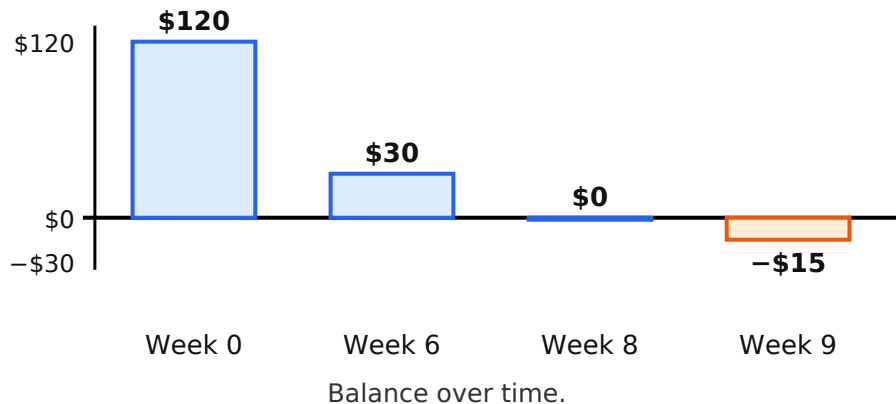
- a. The depth changes by -15 feet each minute: $7 \times (-15) = -105$ feet.
b. $-40 + (-105) = -145$, so the depth is **-145 feet**.
c. The change needed is $-190 - (-40) = -150$ feet. $-150 \div (-15) = 10$, so it takes **10 minutes**.



The submarine moves from -40 ft to -145 ft.

Problem 17: Weekly Fees

- $6 \times (-15) = -90$, a change of $-\$90$.
- $120 + (-90) = 30$, so $\$30$.
- After 8 weeks: $120 - 120 = 0$. After 9 weeks: $120 - 135 = -15$. The balance first goes below $\$0$ after **9 weeks**.



Problem 18: Mean Temperature Change

- The sum is $(-6) + (-9) + (-12) + (-3) + (-10) = -40$. Divide by 5: $-40 \div 5 = -8$. The mean change is -8°F per day.
- Five changes of -8 : $5 \times (-8) = -40$. $20 + (-40) = -20$, so the final temperature is -20°F .
- Five equal changes of the mean add up to the sum of the five actual changes, -40 , so both ways reach -20°F .

-8°F per day; -20°F .

Problem 19: Stock Price Tracker

(a) $5 \times (-4) + 5 \times 2 = -20 + 10 = -10$, so the total change is $-\$10$.

(b) $\$50 + (-\$10) = \$40$.

(c) $-10 \div 10 = -1$, so the price changes by $-\$1$ per day on average.

Total change $-\$10$; price $\$40$; mean change $-\$1$ per day.

Problem 20: Multi-Step Products and Quotients

a. $(-6)(-4) = 24$. Then $24 \div (-8) = -3$.

b. Way 1: $-4(3) = -12$. Way 2: $-4 \cdot 5 + (-4)(-2) = -20 + 8 = -12$. Both give -12 .

c. $\frac{-3 \cdot 8}{4 \cdot 9} = \frac{-24}{36} = -\frac{2}{3}$.

Answers: -3 , -12 , $-\frac{2}{3}$.