Multiplying Integers

Name: _____	Date: _____	Score: _____ / 18

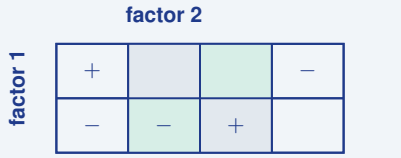
Multiplying integers is really a two-part job: first you figure out the *size* of the answer, then you figure out the *sign*. Multiply the absolute values to get the size. For the sign, count the negative factors—an **even** count gives a positive product, and an **odd** count gives a negative product. That is why $(-4)(-3) = +12$, but $(-4)(-3)(-2) = -24$. This same pattern explains why powers of negative numbers switch signs depending on whether the exponent is even or odd—a handy connection you will use again and again.

Key Concepts & Quick Review

Same signs ⇒ Positive: $(+)(+) = +$ and $(-)(-) = +$

Different signs ⇒ Negative: $(+)(-) = -$ and $(-)(+) = -$

Multiple factors: Count the negatives. **Even** count ⇒ positive product. **Odd** count ⇒ negative product.



Same signs give $+$; different signs give $-$.

Examples

① Evaluate $(-7) \times (-6)$.

Think It Through: First multiply the absolute values: $7 \times 6 = 42$. Then decide the sign by counting negatives. There are two negatives, and an even number of negatives gives a positive product. So $(-7) \times (-6) = 42$.

Answer: 42

② A stock drops \$8 in value each day for 6 consecutive trading days. Write a multiplication expression with integers to represent the total change in value, and then evaluate it.

Think It Through: A drop of \$8 per day is represented by -8. Over 6 days, write the total change as $(-8) \times 6$. Multiply the absolute values: $8 \times 6 = 48$. There is one negative factor, so the product is negative. That means the stock changed by -48, or a loss of \$48.

Answer: -48; *stock lost \$48*

Practice Problems

Find each product.

1. $(-4) \times 7 =$ _____

2. $(-6) \times (-9) =$ _____

3. $5 \times (-8) =$ _____

4. $(-3) \times (-12) =$ _____

5. $(-10) \times 11 =$ _____

6. $(-7) \times (-7) =$ _____

7. $9 \times (-6) =$ _____

8. $(-2) \times (-2) \times (-2) =$ _____

9. $(-5) \times 4 \times (-3) =$ _____

10. $(-8) \times (-4) \times (-1) =$ _____

11. $(-15) \times 3 =$ _____

12. $(-6) \times (-5) \times 2 =$ _____

13. $(-1)^4 =$ _____

14. $(-1)^5 =$ _____

15. $(-4)^3 =$ _____

Study Tips

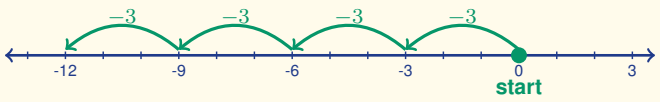
- **Count the negatives** in a product: even count → positive; odd count → negative.
- $(-1)^{\text{even}} = +1$ and $(-1)^{\text{odd}} = -1$. This pattern holds for any negative base raised to a power.
- Multiplying any integer by 0 always gives 0, regardless of sign.

Word Problems

16. A technology company's stock loses \$6 in value every trading day. There are 15 trading days in a three-week period. Write a multiplication expression using integers to represent the total change in the stock's value over those three weeks, and evaluate it. What does the sign of your answer tell you? _____

17. During a card game, a player *earns* 8 points on each of 5 turns and *loses* 12 points on each of 4 turns. Write a multiplication expression for the total points earned and a separate expression for the total points lost, and evaluate both. Then add the two results to find the player's overall net score for the game. _____

18. Starting at 0, the bug below makes *four* equal hops of size -3 (each arrow shows one hop). Write the multiplication expression these hops represent, find the bug's final position, and explain why the answer is negative.



_____

Answer Keys

1) -28
2) 54
3) -40
4) 36
5) -110
6) 49
7) -54
8) -8
9) 60
10) -32
11) -45
12) 60
13) 1
14) -1
15) -64
16) 90 loss
17) net -8 points
18) -12; bug lands at -12

Step-by-Step Explanations

Strategy: For Multiplying Integers, separate the sign decision from the arithmetic; work with the absolute values first, then decide whether the final answer is positive or negative. A small sketch, table, or formula line can make this integer-multiplication topic feel organized.

Practice 1: $(-4) \times 7 =$ **Answer:** -28
For the first worked item, $4 \times 7 = 28$, and the single negative factor makes the product -28.

Practice 15: $(-4)^3 =$ **Answer:** -64
Near the end of this topic, expand $(-4)^3$ as three negative factors; an odd count of negatives leaves the product negative.

Word-problem notes:

16. Answer: $(-6) \times 15 = -90$; the stock lost \$$90$.
Each day's change is -6 dollars, so for 15 days write $(-6) \times 15$. Multiply the absolute values to get 90. Because there is one negative factor, the total change is negative. So the stock lost \$90 altogether.

17. Answer: Earned: $8 \times 5 = 40$; lost: $(-12) \times 4 = -48$; net $= -8$ pts.
Earned points are positive, so $8 \times 5 = 40$ points. Lost points are negative, so $(-12) \times 4 = -48$ points. Now combine the two results: $40 + (-48) = -8$. The player's overall score is -8, which means the losses were greater than the gains.

18. Answer: $4 \times (-3) = -12$; bug lands at -12.
Four hops of -3 is the same as $4 \times (-3)$. Multiplying a positive by a negative produces a negative result, so $4 \times (-3) = -12$. The bug ends at -12. The answer is negative because each hop moves left, so repeated leftward jumps accumulate to a negative total.

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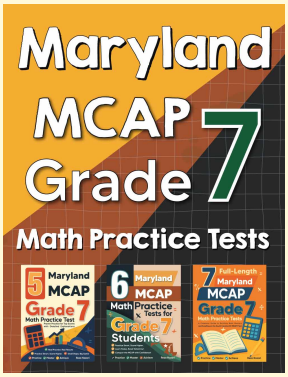

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