Integer Multiplication and Division

Integer multiplication and division: Models and calculations

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QUICK REVIEW

The product or quotient of numbers with the same sign is positive; different signs give a negative result. Thus $(-3)(-4) = 12$, but $(-12)/4 = -3$. Multiply or divide absolute values first, then determine the sign. Zero times any integer is zero; division by zero is undefined.

Worked example

Find $(-6)(-4)$.

1. First calculate sizes: $6 \times 4 = 24$.
2. The signs are the same, so the result is positive: 24.
3. Check $24 \div (-4) = -6$.
Answer: 24.

Practice Problems

Show your thinking.

1. Compute $(-7) \times 5$.

2. Use a sign rule to evaluate $(-8)(-3)$.

3. Find $-42 \div 6$.

4. Model $56 \div (-7)$ as a missing-factor equation and solve.

5. A diver descends 4 m each minute for 9 minutes. Find signed elevation change.

6. Find x in $-9x = -63$.

7. Evaluate $0 \times (-12)$ and state what happens to the sign.

8. Compute $-96 \div (-12)$.

Answer Key

1. -35.
2. 24.
3. -7.
4. $(-7)x = 56$; $x = -8$.
5. -36 meters.
6. $x = 7$.
7. 0.
8. 8.

Step-by-Step Solutions

Follow each calculation, then check your own work.

Problem 1

1. First calculate sizes: $7 \times 5 = 35$.
2. The signs are different, so the result is negative: -35.
3. Check $-35 \div (5) = -7$.

Problem 2

1. First calculate sizes: $8 \times 3 = 24$.
2. The signs are the same, so the result is positive: 24.
3. Check $24 \div (-3) = -8$.

Problem 3

1. First calculate sizes: $42 \div 6 = 7$.
2. The signs are different, so the result is negative: -7.
3. Check $-7 \times (6) = -42$.

Problem 4

1. Let x be the quotient. The related multiplication equation is $(-7)x = 56$.
2. Since $56 \div 7 = 8$ and a negative times a negative gives a positive, use $x = -8$.
3. Check $(-7)(-8) = 56$.

Problem 5

1. First calculate sizes: $4 \times 9 = 36$.
2. The signs are different, so the result is negative: -36 meters.
3. Check $-36 \div (9) = -4$.

Problem 6

1. The given equation is $(-9)x = -63$. Divide both sides by -9.
2. The quotient has magnitude $63 \div 9 = 7$ and is positive.
3. So $x = 7$; check $(-9)(7) = -63$.

Problem 7

1. The zero factor makes every repeated-addition contribution 0; $0 + 0 = 0$.
2. $(0) \times (-12) = 0$. Zero is neither positive nor negative.

Problem 8

1. First calculate sizes: $96 \div 12 = 8$.
2. The signs are the same, so the result is positive: 8.
3. Check $8 \times (-12) = -96$.

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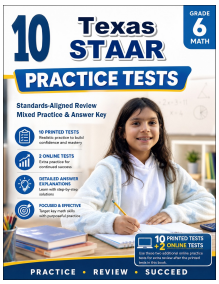

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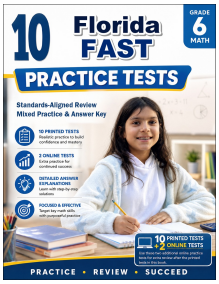

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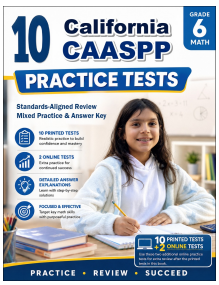

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