



Math Operations in Fractions: Simplifying, Multiplying, and Dividing

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Learning Objectives

- Recall multiplication facts and connect them to fraction operations
- Simplify fractions by factoring out the greatest common factor
- Multiply fractions and express results in lowest terms
- Divide fractions using the reciprocal (keep-change-flip) method

Simplify each fraction or perform the indicated operation, writing every answer in lowest terms.

1. Warmup: Add the fractions and simplify.

$$\frac{1}{4} + \frac{1}{4}$$

Answer: _____

2. Warmup: Subtract the fractions and simplify.

$$\frac{5}{6} - \frac{1}{3}$$

Answer: _____

3. Use the multiplication table to identify the GCF, then simplify.

$$\frac{12}{18}$$

Answer: _____

4. Simplify by factoring out the greatest common factor.

$$\frac{24}{36}$$

Answer: _____

5. Simplify by factoring.

$$\frac{45}{60}$$

Answer: _____

6. Multiply the fractions and simplify your answer.

$$\frac{2}{3} \cdot \frac{9}{10}$$

Answer: _____



7. Multiply the fractions and write the result in lowest terms.

$$\frac{4}{7} \cdot \frac{14}{8}$$

Answer: _____

8. Divide the fractions by multiplying by the reciprocal.

$$\frac{3}{5} \div \frac{9}{10}$$

Answer: _____

9. Divide the fractions and simplify.

$$\frac{7}{8} \div \frac{21}{16}$$

Answer: _____

10. Perform the indicated operations and simplify.

$$\frac{5}{6} \cdot \frac{12}{25} \div \frac{2}{5}$$

Answer: _____





This worksheet covers all topics from Week 2 of Elementary Algebra: warmup fraction review, connecting fractions to the multiplication table, simplifying by factoring with the GCF, multiplying fractions, and dividing fractions using reciprocals.

Solutions

1. Warmup: Add the fractions and simplify.

$$\frac{1}{4} + \frac{1}{4}$$

→ Since the denominators are the same, add the numerators: one plus one equals two.

→ Write the result over the common denominator four to get two-fourths.

→ Divide both numerator and denominator by two to simplify to one-half.

Answer: $\frac{1}{2}$

2. Warmup: Subtract the fractions and simplify.

$$\frac{5}{6} - \frac{1}{3}$$

→ Find a common denominator of six and rewrite one-third as two-sixths.

→ Subtract the numerators five minus two to get three-sixths.

→ Simplify three-sixths by dividing top and bottom by three to get one-half.

Answer: $\frac{1}{2}$

3. Use the multiplication table to identify the GCF, then simplify.

$$\frac{12}{18}$$

→ Find the greatest common factor of twelve and eighteen using the multiplication table; it is six.

→ Divide the numerator twelve by six to get two.

→ Divide the denominator eighteen by six to get three, giving two-thirds.

Answer: $\frac{2}{3}$

4. Simplify by factoring out the greatest common factor.

$$\frac{24}{36}$$

→ Factor twenty-four as twelve times two and thirty-six as twelve times three.

→ Cancel the common factor of twelve from numerator and denominator.

→ The simplified fraction is two-thirds.

Answer: $\frac{2}{3}$



5. Simplify by factoring.

$$\frac{45}{60}$$

- Identify the greatest common factor of forty-five and sixty, which is fifteen.
- Divide forty-five by fifteen to get three.
- Divide sixty by fifteen to get four, so the answer is three-fourths.

Answer: $\frac{3}{4}$

6. Multiply the fractions and simplify your answer.

$$\frac{2}{3} \cdot \frac{9}{10}$$

- Cross-cancel the two with the ten to leave one and five, and the nine with the three to leave three and one.
- Multiply the remaining numerators one times three to get three.
- Multiply the remaining denominators one times five to get five, giving three-fifths.

Answer: $\frac{3}{5}$

7. Multiply the fractions and write the result in lowest terms.

$$\frac{4}{7} \cdot \frac{14}{8}$$

- Cancel the common factor of four between four and eight, leaving one and two.
- Cancel the common factor of seven between seven and fourteen, leaving one and two.
- Multiply across to get two over two, which simplifies to one.

Answer: 1

8. Divide the fractions by multiplying by the reciprocal.

$$\frac{3}{5} \div \frac{9}{10}$$

- Keep the first fraction, change division to multiplication, and flip the second fraction to ten-ninths.
- Cancel the common factor of three between three and nine, and the common factor of five between five and ten.
- Multiply the remaining numbers to obtain two-thirds.

Answer: $\frac{2}{3}$

9. Divide the fractions and simplify.

$$\frac{7}{8} \div \frac{21}{16}$$

- Multiply the first fraction by the reciprocal of the second to get seven-eighths times sixteen-twenty-firsts.
- Cancel the common factor of seven between seven and twenty-one, and the common factor of eight between eight and sixteen.
- Multiply the remaining factors to obtain two-thirds.

Answer: $\frac{2}{3}$



10. Perform the indicated operations and simplify.

$$\frac{5}{6} \cdot \frac{12}{25} \div \frac{2}{5}$$

→ Rewrite the division as multiplication by the reciprocal, giving five-sixths times twelve twenty-fifths times five-halves.

→ Cancel common factors: five with twenty-five leaves one and five, six with twelve leaves one and two, and the remaining two with two cancels.

→ Multiply the remaining numbers across to get five over five, which equals one.

Answer: 1

