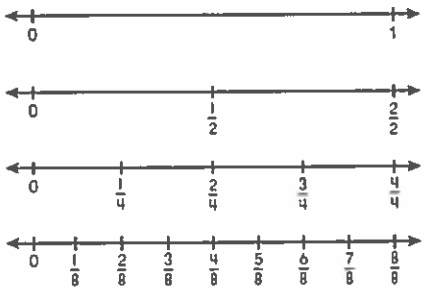
3 Let's Be Rational UNIT

Main Focus: *Understanding Fraction Operations*

Numeric Estimation: Understand that estimation is a tool used in a variety of situations including checking answers and making decisions, and develop strategies for estimating results of arithmetic operations.

ANSWERS

- Use benchmarks and other strategies to estimate results of operations with fractions
- Use estimates to check the reasonableness of exact computations
- Give various reasons to estimate and identify when a situation calls for an overestimate or an underestimate
- Use estimates and exact solutions to make decisions



Fraction Operations: Revisit and continue to develop meanings for the four arithmetic operations and skill at using algorithms for each.

- Determine when addition, subtraction, multiplication, or division is the appropriate operation to solve a problem
- Develop ways to model sums, differences, products, and quotients with areas, fraction strips, and number lines
- Use knowledge of fractions and equivalence of fractions to develop algorithms for adding, subtracting, multiplying, and dividing fractions
- Write fact families with fractions to show the inverse relationship between addition and subtraction, and between multiplication and division
- Compare and contrast dividing a whole number by a fraction to dividing a fraction by a whole number
- Recognize that when you multiply or divide a fraction, your answer might be less than or more than the numbers you started with
- Solve real-world problems using arithmetic operations on fractions

Fraction fact family for the number sentence $\frac{7}{10}+\frac{1}{2}=\frac{6}{5}$
$\frac{7}{10}+\frac{1}{2}=\frac{6}{5}$
$\frac{1}{2}+\frac{7}{10}=\frac{6}{5}$
$\frac{6}{5}-\frac{1}{2}=\frac{7}{10}$
$\frac{6}{5}-\frac{7}{10}=\frac{1}{2}$

Variables and Equations: Use variables to represent unknown values and equations to represent relationships.

- Represent unknown real-world and abstract values with variables
- Write equations (or number sentences) to represent relationships among real-world and abstract values
- Use fact families to solve for unknown values

Adding unlike fractions (denominators 2-12)

Grade 6 Fraction Worksheet

Find the sum of the following fractions.

1. $\frac{4}{5} + \frac{9}{11} = 1\frac{34}{55}$

2. $\frac{5}{6} + \frac{2}{9} = 1\frac{1}{18}$

3. $\frac{5}{9} + \frac{3}{8} = \frac{67}{72}$

4. $\frac{2}{12} + \frac{5}{8} = \frac{19}{24}$

5. $\frac{6}{11} + \frac{2}{3} = 1\frac{7}{33}$

6. $\frac{1}{4} + \frac{7}{10} = \frac{19}{20}$

7. $\frac{5}{6} + \frac{6}{12} = 1\frac{1}{3}$

8. $\frac{2}{7} + \frac{3}{7} = \frac{5}{7}$

9. $\frac{1}{2} + \frac{2}{6} = \frac{5}{6}$

10. $\frac{1}{3} + \frac{3}{12} = \frac{7}{12}$

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Subtracting unlike fractions

Grade 6 Fraction Worksheet

Find the difference.

1. $\frac{2}{3} - \frac{2}{4} = \frac{1}{6}$

2. $\frac{5}{9} - \frac{2}{5} = \frac{7}{45}$

3. $\frac{1}{2} - \frac{1}{9} = \frac{7}{18}$

4. $\frac{5}{7} - \frac{5}{11} = \frac{20}{77}$

5. $\frac{7}{9} - \frac{2}{3} = \frac{1}{9}$

6. $\frac{1}{2} - \frac{1}{4} = \frac{1}{4}$

7. $\frac{2}{4} - \frac{3}{7} = \frac{1}{14}$

8. $\frac{4}{7} - \frac{6}{12} = \frac{1}{14}$

9. $\frac{2}{4} - \frac{2}{11} = \frac{7}{22}$

10. $\frac{7}{8} - \frac{3}{8} = \frac{1}{2}$

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ANSWER KEY

Fractions of Groups

Find the product of each pair of fractions. Simplify your answers when possible.

a. What is $\frac{1}{3}$ of $\frac{1}{4}$?

$\frac{1}{3} \times \frac{1}{4} = \frac{1}{12}$

b. What is $\frac{1}{3}$ of $\frac{7}{8}$?

$\frac{1}{3} \times \frac{7}{8} = \frac{7}{24}$

c. What is $\frac{3}{4}$ of $\frac{3}{7}$?

$\frac{3}{4} \times \frac{3}{7} = \frac{9}{28}$

d. $\frac{1}{2} \times \frac{2}{8} = \frac{2}{16} = \frac{1}{8}$

e. $\frac{1}{3} \times \frac{2}{7} = \frac{2}{21}$

f. $\frac{5}{5} \times \frac{1}{5} = \frac{5}{25} = \frac{1}{5}$

g. $\frac{3}{9} \times \frac{3}{4} = \frac{9}{36} = \frac{1}{4}$

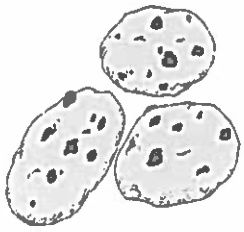
h. $\frac{1}{4} \times \frac{1}{4} = \frac{1}{16}$

i. $\frac{5}{10} \times \frac{6}{10} = \frac{30}{100} = \frac{3}{10}$

j. $\frac{2}{12} \times \frac{1}{2} = \frac{2}{24} = \frac{1}{12}$

k. $\frac{2}{6} \times \frac{1}{2} = \frac{2}{12} = \frac{1}{6}$

l. $\frac{1}{4} \times \frac{4}{7} = \frac{4}{28} = \frac{1}{7}$



k. Jacob is baking chocolate chip cookies. The recipe uses $\frac{3}{4}$ cup of sugar. Jacob wants to make one-half of a batch. How many cups of sugar does he need? $\frac{3}{8}$ of a cup

m. In the fridge, Hannah had $\frac{2}{3}$ of a quart of milk. She used half of this milk when she had breakfast cereal. How much milk did she use? $\frac{1}{3}$ of a quart

I can divide proper fractions and simplify my answer into lowest terms.

Dividing Proper Fractions Introduction

We can learn how to divide fractions by using our well-known **Inverse Property of Multiplication.**

$\frac{4}{5} \div \frac{4}{5} = 1$ $\quad \frac{4}{5} \cdot \frac{5}{4} = 1$ $\quad 5 \div \frac{5}{1} = 1$ $\quad 5 \cdot \frac{1}{5} = 1$

What do you notice about the difference in the 2nd fraction when you change from division to multiplication?

Dividing by a fraction is the same as multiplying **by the** reciprocal **of the second fraction.**

Let's Do a Couple Examples:

1. $\frac{3}{4} \div \frac{3}{8} =$ 2

$\frac{3}{4} \cdot \frac{8}{3} = \frac{24}{12} = \boxed{2}$

2. $\frac{1}{4} \div \frac{5}{6}$

$\frac{1}{2\cancel{4}} \cdot \frac{\cancel{6}^{3}}{5} = \frac{6 \div 2}{20 \div 2} = \boxed{\frac{3}{10}}$

3. $\frac{8}{9} \div \frac{4}{7} =$

$\frac{\cancel{8}^{2}}{9} \cdot \frac{7}{\cancel{4}_{1}} = \frac{14}{9} = \boxed{1\frac{5}{9}}$

4. $\frac{10}{27} \div \frac{1}{9}$

$\frac{\cancel{10}^{10}}{\cancel{27}_{3}} \cdot \frac{\cancel{9}^{1}}{\cancel{1}} = \frac{10}{3} = \boxed{3\frac{1}{3}}$

5. $\frac{5}{12} \div \frac{10}{1}$

$\frac{\cancel{5}}{12} \cdot \frac{1}{\cancel{10}_{2}} = \boxed{\frac{1}{24}}$

6. $\frac{14}{1} \div \frac{6}{7}$

$\frac{\cancel{14}^{7}}{1} \cdot \frac{7}{\cancel{6}_{3}} = \frac{49}{3} = \boxed{16\frac{1}{3}}$

7. $2\frac{1}{2} \div \frac{3}{4}$

$\frac{5}{\cancel{2}_{1}} \cdot \frac{\cancel{4}^{2}}{3} = \frac{10}{3} = \boxed{3\frac{1}{3}}$

8. $\frac{3}{4} \div \frac{3}{12} =$

$\frac{\cancel{15}^{3}}{\cancel{4}_{1}} \cdot \frac{\cancel{12}^{3}}{\cancel{5}_{1}} = \frac{9}{1} = \boxed{9}$

Dividing fractions by fractions

Grade 5 Fractions Worksheet

Find the quotient.

1. $\frac{1}{4} \div \frac{9}{10} = \frac{5}{18}$

2. $\frac{5}{9} \div \frac{1}{2} = 1\frac{1}{9}$

3. $\frac{1}{3} \div \frac{6}{9} = \frac{1}{2}$

4. $\frac{8}{10} \div \frac{2}{5} = 2$

5. $\frac{3}{8} \div \frac{7}{8} = \frac{3}{7}$

6. $\frac{2}{5} \div \frac{1}{2} = \frac{4}{5}$

7. $\frac{5}{10} \div \frac{6}{12} = 1$

8. $\frac{7}{11} \div \frac{1}{6} = 3\frac{9}{11}$

9. $\frac{5}{6} \div \frac{5}{10} = 1\frac{2}{3}$

10. $\frac{1}{4} \div \frac{1}{7} = 1\frac{3}{4}$

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Teacher : _____ Date : _____

Dividing Fractions and Whole Numbers

1) $\frac{2}{4} \div 3 = \frac{2 \times 1}{4 \times 3} = \frac{2}{12} = \frac{1}{6}$

2) $\frac{1}{2} \div 6 = \frac{1 \times 1}{2 \times 6} = \frac{1}{12}$

3) $5 \div \frac{8}{10} = \frac{5 \times 10}{1 \times 8} = \frac{50}{8} = \frac{25}{4} = 6\frac{1}{4}$

4) $9 \div \frac{3}{4} = \frac{9 \times 4}{1 \times 3} = \frac{36}{3} = \frac{12}{1} = 12$

5) $\frac{2}{3} \div 9 = \frac{2 \times 1}{3 \times 9} = \frac{2}{27}$

6) $7 \div \frac{4}{5} = \frac{7 \times 5}{1 \times 4} = \frac{35}{4} = 8\frac{3}{4}$

7) $\frac{4}{5} \div 6 = \frac{4 \times 1}{5 \times 6} = \frac{4}{30} = \frac{2}{15}$

8) $\frac{3}{4} \div 8 = \frac{3 \times 1}{4 \times 8} = \frac{3}{32}$

9) $5 \div \frac{1}{4} = \frac{5 \times 4}{1 \times 1} = \frac{20}{1} = 20$

10) $4 \div \frac{1}{4} = \frac{4 \times 4}{1 \times 1} = \frac{16}{1} = 16$

11) $8 \div \frac{1}{4} = \frac{8 \times 4}{1 \times 1} = \frac{32}{1} = 32$

12) $10 \div \frac{4}{5} = \frac{10 \times 5}{1 \times 4} = \frac{50}{4} = \frac{25}{2} = 12\frac{1}{2}$

13) $\frac{3}{4} \div 4 = \frac{3 \times 1}{4 \times 4} = \frac{3}{16}$

14) $\frac{1}{2} \div 4 = \frac{1 \times 1}{2 \times 4} = \frac{1}{8}$

15) $\frac{6}{10} \div 6 = \frac{6 \times 1}{10 \times 6} = \frac{6}{60} = \frac{1}{10}$

Math-Aids.Com
Fractions Worksheets

Answers

1. $18 \div \frac{1}{8} = 144$

   The baker can make 144 croissants.

2. $12 \div \frac{1}{16} = 192$

   The assistant can help prepare 192 bowls of soup.

3. $\frac{1}{2} \div 16 \div 4 = \frac{1}{128}$

   Each cookie weighs $\frac{1}{128}$ kilograms.

4. $\left(1 - \frac{4}{5}\right) \div 3 = \frac{1}{15}$

   Each friend ate $\frac{1}{15}$ of the pie.

5. $\frac{1}{3} \div 8 = \frac{1}{24}$

   $\frac{1}{24}$ cup of milk is used for each large cupcake.

6. $\frac{1}{15} \div 3 \times 5 = \frac{1}{9}$

   $\frac{1}{9}$ pound of cheese is used to make 5 pizzas.

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