

Simplifying Fractions

Goal: Simplify fractions.

Vocabulary

Fraction:

Simplest form of a fraction:

Equivalent fractions:

EXAMPLE 1 Writing a Fraction in Simplest Form

Farming A farmer has 8 acres of pasture, 48 acres of wheat, 52 acres of hay, and 24 acres of corn. What fraction of the total number of acres is corn?

Solution

Write the fraction of the total number of acres that is corn. Then simplify.

$$\frac{\text{Number of acres of corn}}{\text{Total number of acres}} = \frac{24}{\boxed{}}$$

Method 1: Find and use the GCF of 24 and .

$$24 = \boxed{} \cdot 3 \qquad \boxed{} = \boxed{} \cdot 3 \cdot \boxed{}$$

The GCF of 24 and is .

$$\frac{24}{\boxed{}} = \frac{24 \div \boxed{}}{\boxed{} \div \boxed{}} = \frac{\boxed{}}{\boxed{}}$$

Divide numerator and denominator by GCF and simplify.

Method 2: Write the prime factorization of each number.

$$\frac{24}{\boxed{}} = \frac{\boxed{} \cdot 3}{\boxed{} \cdot 3 \cdot \boxed{}}$$

Write prime factorizations.

$$= \frac{\boxed{} \cdot 3^1}{\boxed{} \cdot 3^1 \cdot \boxed{}} = \frac{\boxed{}}{\boxed{}}$$

Divide out common factors and simplify.

Answer: The fraction of the farmer's acres that is corn is .

EXAMPLE 2 Identifying Equivalent Fractions

Tell whether the fractions $\frac{4}{5}$ and $\frac{28}{35}$ are equivalent.

Write each fraction in simplest form.

$\frac{4}{5}$ is in simplest form.

$$\frac{28}{35} = \frac{28 \div \boxed{}}{35 \div \boxed{}} = \boxed{}$$

Answer: The fractions $\boxed{}$ equivalent.

EXAMPLE 3 Writing Equivalent Fractions

Write two fractions that are equivalent to $\frac{8}{12}$.

Multiply or divide the numerator and denominator by the same nonzero number.

$$\frac{8}{12} = \frac{8 \times 2}{12 \times 2} = \boxed{}$$

Multiply numerator and denominator by 2.

$$\frac{8}{12} = \frac{8 \div 4}{12 \div 4} = \boxed{}$$

Divide numerator and denominator by 4, a common factor of 8 and 12.

Answer: The fractions $\boxed{}$ and $\boxed{}$ are equivalent to $\frac{8}{12}$.

A fraction has many equivalent fractions. There are other correct answers to Example 3.

Guided Practice Use the information in Example 1. Write the fraction of the total number of acres that are the given crop. Simplify if possible.

1. pasture	2. wheat	3. hay

Write two fractions that are equivalent to the given fraction.

4. $\frac{7}{21}$	5. $\frac{8}{20}$	6. $\frac{18}{24}$	7. $\frac{10}{16}$

EXAMPLE 4 Simplifying and Evaluating an Expression

Simplify the expression $\frac{-18x}{9x^3}$. Then evaluate when $x = 2$.

$$\frac{-18x}{9x^3} = \frac{-1 \cdot \boxed{}}{\boxed{}}$$

Factor numerator and denominator.

$$\frac{-18x}{9x^3} = \frac{-1 \cdot 2 \cdot \cancel{x^1} \cdot \boxed{}}{\cancel{x^1} \cdot \boxed{}}$$

Divide out common factors.

$$= \frac{-2}{\boxed{}}$$

Simplify.

$$= \frac{-2}{\boxed{}}$$

Substitute 2 for x .

$$= \frac{-2}{\boxed{}} = \boxed{}$$

Evaluate power and simplify.

Guided Practice Simplify the algebraic expression.

Then evaluate when $a = 2$ and $b = -3$.

8. $\frac{12b}{3ab}$	9. $\frac{35a^2b}{5b}$	10. $\frac{2b^4}{18b}$	11. $\frac{24ab}{4b^2}$
----------------------	------------------------	------------------------	-------------------------

Homework