

TOPIC: SIMPLIFYING FRACTIONS

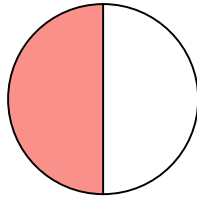
Equivalent Fractions

◆ **Equivalent fractions** represent the same *part* of a whole.

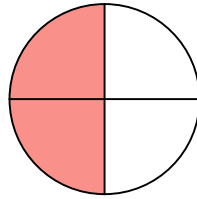
► You can get equivalent fractions by *multiplying* the numerator and denominator by the _____ constant.

New

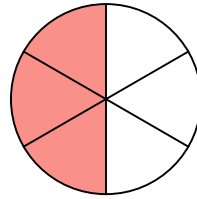
$$\frac{a}{b} = \frac{a \cdot}{b \cdot}$$



$$\frac{1}{2}$$



$$\frac{2}{4}$$

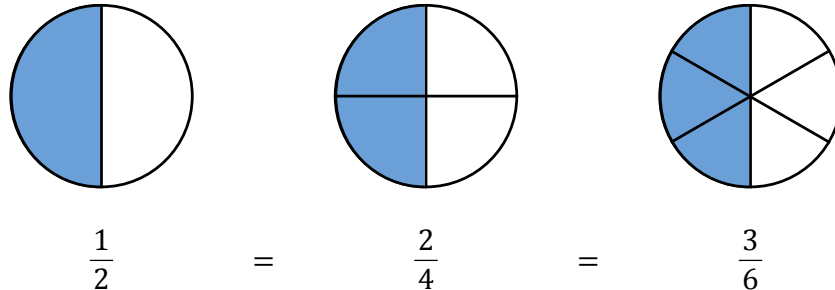


$$\frac{3}{6}$$

TOPIC: SIMPLIFYING FRACTIONS

Simplify Fractions (Write Fractions in Lowest Terms)

◆ Recall: You can get equivalent fractions by *multiplying* the numerator and denominator by the same constant.



► To **simplify** a fraction into **lowest terms**, factor num. and denom. & *divide out* (_____) greatest common factor.

New **Simplifying Fractions**

$$\frac{a \cdot c}{b \cdot c} = \quad = \quad = \frac{a}{b}$$

$$\frac{4}{6} = \underline{\quad}$$

◆ If GCF isn't obvious, factor num. & denom. into *prime* factors OR choose ____ common factor & work in stages.

EXAMPLE

Simplify the following fractions to lowest terms.

(A) $\frac{80}{60}$

(B) $\frac{5}{4}$

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PRACTICE

Simplify the following fraction to lowest terms.

(A) $\frac{16}{24}$

(B) $-\frac{28}{49}$

(C) $\frac{3}{7}$

EXAMPLE

A work shift for an employee at a donut shop consists of 6 hours. What fraction of the employee's work shift is represented by 2 hours?

EXAMPLE

There are 45 students in a math class. If 20 students aced the first exam, what fraction of the students got an A?

TOPIC: SIMPLIFYING FRACTIONS

Simplifying Variable Fractions

◆ Recall: We can simplify fractions by canceling common factors in the numerator and denominator.

Recall	Simplifying Fractions	New	Simplifying Fractions with Variables
	$\frac{4}{6} = \frac{\cancel{2} \cdot 2}{\cancel{2} \cdot 3} = \frac{2}{3}$		$\frac{4xy}{6y} = \underline{\hspace{2cm}} = \underline{\hspace{2cm}}$

◆ If there is an _____ on a variable (x^n) in a fraction, rewrite as multiplication (e.g. $x^3 = x \cdot x \cdot x$)

EXAMPLE

Simplify the following fractions:

(A)
$$\frac{10a^2}{12ab}$$

(B)
$$\frac{18x^2}{21x^3 \cdot y}$$

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PRACTICE

Simplify the following fraction to lowest terms.

(A) $\frac{30y}{80}$

(B) $\frac{15x}{35}$

(C) $-\frac{42mn}{60n}$

PRACTICE

Simplify the following fraction to lowest terms.

(A) $\frac{46x^2y^2}{24x^2y}$

(B) $\frac{100abc}{40bc}$

(C) $\frac{224x^3y^4z^2}{24xy^4z^2}$

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EXAMPLE

Evaluate each expression using the given replacement values. Simplify first if necessary.

(A) $\frac{x^3}{36}$ when $x = -3$

(B) $\frac{y^2}{15}$ when $y = 5$

(C) $\frac{3ab^2}{27a}$ when $b = 2$

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Determine If Fractions Are Equivalent

◆ Recall: Two fractions are equivalent if they represent the same part of a whole.

► We can determine if 2 fractions are equivalent by **simplifying** or using **cross products**.

Simplification	Cross Products
$\frac{4}{7} \stackrel{?}{=} \frac{12}{21}$ 1) Factor numerators & denominators $\frac{2 \cdot 2}{7} \stackrel{?}{=} \frac{2 \cdot 2 \cdot 3}{3 \cdot 7}$ 2) Cancel common factors $\frac{2 \cdot 2}{7} \stackrel{?}{=} \frac{2 \cdot 2 \cdot \cancel{3}}{\cancel{3} \cdot 7}$ 3) Rewrite in simplest form $\frac{4}{7} = \frac{4}{7}$	$\frac{4}{6} \stackrel{?}{=} \frac{6}{9}$ 1) Multiply numbers _____ across both fractions $\stackrel{?}{=}$ 2) Compute products on both sides $=$

◆ Use **simplifying** when 1 frac is already simplified. Use **cross products** when the products are easy to compute.

EXAMPLE

Determine if the fractions below are equivalent.

$$\frac{7}{9} \stackrel{?}{=} \frac{10}{6}$$

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PRACTICE

Determine if the following pair of fractions is equivalent by simplifying.

$$\frac{3}{5} \text{ \& } \frac{12}{20}$$

PRACTICE

Determine if the following pair of fractions is equivalent using cross products.

$$\frac{-6}{21} \text{ \& } \frac{2}{7}$$

PRACTICE

Determine if the following pair of fractions is equivalent using cross products.

$$\frac{9}{4} \text{ \& } \frac{27}{12}$$