

## Chapter 4 section 1 Equivalent fractions

Vocabulary:

fraction: form:  $\frac{a}{b}$

numerator: a

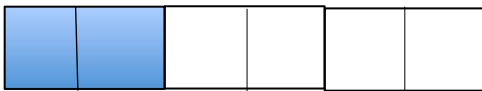
denominator: b

Equivalent Fractions - represent the same numerical value  
Visualization

$\frac{1}{3}$



$\frac{2}{6}$



Visualization of equivalent fractions:  $\frac{1}{3} = \frac{2}{6}$

Notice that if start with fraction,  $\frac{1}{3}$  and multiply both numerator and denominator by 2

$$\frac{1}{3} = \frac{1 \cdot 2}{3 \cdot 2} \text{ the results is } \frac{2}{6}$$

Create equivalent fractions:

Start with a fraction, then multiply both its numerator and denominator by same number, the resulting fraction is equivalent to the original fraction

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

The revers is also true. Instead of multiplying, one can divide.

$$\frac{2}{6} = \frac{2 \div 2}{6 \div 2}, \text{ the results is } \frac{1}{3}$$

Divisor, factor

36 is divided by 4, remainder of 0, therefore 4 is a divisor of 36, 4 is a factor of 36

25 is divided by 4, remainder is not zero, therefore 4 is not a divisor of 25, 4 is not a factor of 25.

Divisors

18: 1, 2, 3, 6, 9, 18

24: 1, 2, 3, 4, 6, 8, 12, 24

Common divisors: 1, 2, 3, 6

Greatest common factor (GCF): 6

Reduce fractions to lowest terms:

A fraction is reduced to lowest terms if the GCF = 1

Reduce:  $\frac{18}{24}$  The GCF between 18 and 24 is 6, so divide by 6

$$\frac{18 \div 6}{24 \div 6}$$

$$\frac{3}{4}$$

Or factor

6 is a divisor

6 is a factor

$$\frac{18}{24} = \frac{3 \cdot 6}{4 \cdot 6}$$

Use a factor tree to find the prime factors of 18 and 24

$$\frac{18}{24} = \frac{2 \cdot 3 \cdot 3}{2 \cdot 2 \cdot 2 \cdot 3} \text{ reduce}$$

$$\frac{3}{4}$$

Reduce fractions with variables

$$\frac{56x^2y}{60xy^2}$$

Equivalent fractions in higher terms.

$\frac{3}{5}$  with a denominator of 20

Negative fractions

placement of negative sign

$$\frac{3}{-5} = \frac{-3}{5} = -\frac{3}{5}$$

Practice

1)  $\frac{18}{20}$

2)  $\frac{54x^3y^3}{60xy^2}$

3)  $\frac{50x^3}{-75x^5}$

4)  $\frac{-12xy^2}{-18x^2y}$