
4.4 Addition and Subtraction of Fractions with Common Denominators

Models of Addition of Fractions

Example (a)

Quarters are so named because they represent one quarter of a dollar. We



$$\frac{1}{4} + \frac{2}{4} = \frac{3}{4}$$

one quarter + two quarters = three quarters

Example (b)

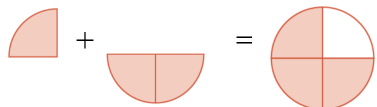
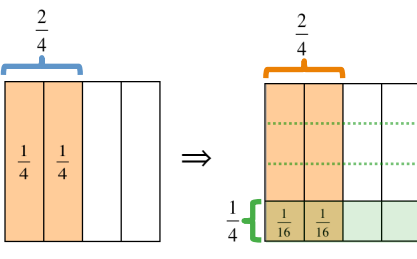
The word “dime” is adapted from Old French, “disme”, meaning one tenth (of a dollar).




$$\frac{3}{10} + \frac{4}{10} = \frac{7}{10}$$

three dimes + four dimes = seven dimes

Comparison of Fraction Addition with Fraction Multiplication

$$\frac{1}{4} + \frac{2}{4} = \frac{1+2}{4} = \frac{3}{4}$$

$$\frac{1}{4} \cdot \frac{2}{4} = \frac{1 \cdot 2}{4 \cdot 4} = \frac{2}{16}$$

Notice that only the numerators were added.

Notice that the numerators were multiplied and the denominators were multiplied.

Addition of Fractions with Common Denominators Property

For any real numbers a , b , and c ($c \neq 0$) $\frac{a}{c} + \frac{b}{c} = \frac{a+b}{c}$

<i>Demonstration Problems</i>	<i>Practice Problems</i>
Add and simplify, if possible. 1. (a) $\frac{3}{7} + \frac{2}{7} =$	Add and simplify, if possible. 1. (b) $\frac{3}{5} + \frac{1}{5} =$
2. (a) $\frac{x}{4} + \frac{3}{4} =$	2. (b) $\frac{x}{3} + \frac{2}{3} =$
3. (a) $-\frac{6}{m} + \frac{8}{m} =$	3. (b) $-\frac{9}{d} + \frac{3}{d} =$
4. (a) $\frac{w}{7} + \frac{5w}{7} =$	4. (b) $\frac{2n}{11} + \frac{5n}{11} =$
Answers: 1. (b) $\frac{4}{5}$; 2. (b) $\frac{x+2}{3}$; 3. (b) $-\frac{6}{d}$; 4. (b) $\frac{7n}{11}$	

<i>Demonstration Problems</i>	<i>Practice Problems</i>
<p>Simplify.</p> <p>5. (a) $\frac{19}{28} - \frac{7}{28} =$</p> <p>6. (a) $\frac{x}{7} - \frac{2}{7} =$</p> <p>7. (a) $-\frac{9}{x} - \frac{7}{x} =$</p> <p>8. (a) $-\frac{3}{7} - \left(-\frac{5}{7}\right) =$</p>	<p>Simplify.</p> <p>5. (b) $\frac{23}{24} - \frac{14}{24} =$</p> <p>6. (b) $\frac{y}{6} - \frac{1}{6} =$</p> <p>7. (b) $-\frac{10}{x} - \frac{4}{x} =$</p> <p>8. (b) $-\frac{7}{9} - \left(-\frac{5}{9}\right) =$</p>
Answers: 5. (b) $\frac{3}{8}$; 6. (b) $\frac{y-1}{6}$; 7. (b) $-\frac{14}{x}$; 8. (b) $-\frac{2}{9}$	