

Chapter 4 Lesson 4

Add & Subtract Fractions with Common Denominators

Lesson Objectives:

- Model fraction addition
- Add fractions with a common denominator
- Model fraction subtraction
- Subtract fractions with a common denominator

Model Fraction Addition *notes*

Model Fraction Addition

You can model fraction addition with money. Imagine you have some quarters.



One quarter plus two quarters equals three quarters.

Now, quarters are literally fractions (one quarter!) of a dollar. Since quarters are another way to say fourths, we can use fractions to represent this addition.

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

One quarter + two quarters = three quarters

We can model all sorts of fraction problems using fraction circles or fraction tiles. Let's look at the above problem using fraction tiles.



Example Problems

Use a model to find the sum.

$$\frac{3}{8} + \frac{3}{8}$$

$$\frac{6}{8}$$

your turn!

$$\frac{1}{6} + \frac{4}{6}$$

$$\frac{5}{6}$$

Add Fractions with a Common Denominator *notes*

Common Denominators

When you add the same-size pieces (the fractions have the same denominator!) you just add the number of pieces.

If a , b , and c are numbers where $c \neq 0$, then

$$\frac{a}{c} + \frac{b}{c} = \frac{a+b}{c}$$

So, to add fractions with a common denominator, add the numerators and place the sum over the common denominator.

Example Problems

Find the sum.

$$\frac{3}{5} + \frac{1}{5}$$

$$\frac{4}{5}$$

$$\frac{x}{4} + \frac{2}{4}$$

$$\frac{x+2}{4}$$

$$-\frac{7}{9} + \frac{9}{9}$$

$$\frac{2}{9}$$

$$\frac{2n}{11} + \frac{5n}{11}$$

$$\frac{7n}{11}$$

$$-\frac{3}{12} + \left(-\frac{4}{12}\right)$$

your turn

$$\frac{3}{6} + \frac{2}{6}$$

$$\frac{5}{6}$$

$$\frac{y}{7} + \frac{5}{7}$$

$$\frac{y+5}{7}$$

$$-\frac{4}{p} + \frac{5}{p}$$

$$\frac{1}{p}$$

$$\frac{3h}{9} + \frac{7h}{9}$$

$$\frac{10h}{9}$$

$$-\frac{4}{15} + \left(-\frac{5}{15}\right)$$

$$-\frac{9}{15}$$

$$-\frac{9}{15} \div \frac{3}{5}$$

$$-\frac{4j}{5} + \frac{3j}{5}$$

$$-\frac{j}{5}$$

Model Fraction Subtraction *notes*

Model Fraction Subtraction

Subtracting two fractions with common denominators is essentially the same as adding them. If your denominators are the same, just subtract the numerators!

Say you have a pizza with 8 slices. You ate three pieces for dinner. That means that after dinner, you had five pieces left. If you ate two of those remaining pieces, how much is left?

$$\frac{5}{8} - \frac{2}{8} = \frac{3}{8}$$

Five eighths minus two eighths equals three eighths.

We could show that with fraction circles or tiles also.



Example Problems

Use a model to find the difference .

$$\frac{4}{5} - \frac{1}{5}$$

$$\frac{3}{5}$$

your turn!

$$\frac{6}{7} - \frac{2}{7}$$

$$\frac{4}{7}$$

Subtract Fractions with a Common Denominator *notes*

Common Denominators

When you subtract the same-size pieces (the fractions have the same denominator!) you just subtract the number of pieces.

If a , b , and c are numbers where $c \neq 0$, then

$$\frac{a}{c} - \frac{b}{c} = \frac{a - b}{c}$$

So, to subtract fractions with a common denominator, subtract the numerators and place the sum over the common denominator.

Example Problems

Find the difference.

$$\frac{3}{5} - \frac{1}{5}$$

$$\frac{2}{5}$$

$$\frac{x}{4} - \frac{2}{4}$$

$$\frac{x-2}{4}$$

$$-\frac{7}{9} - \frac{9}{9}$$

$$\frac{-16}{9}$$

$$\frac{2n}{13} - \frac{5n}{13}$$

$$\frac{-3n}{13}$$

$$-\frac{3}{12} - \left(-\frac{4}{12}\right) = \frac{-3+4}{12} = \frac{1}{12}$$

$$\frac{3}{8} + \left(-\frac{4}{8}\right) - \frac{1}{8} = \frac{-2}{8} = \frac{-1}{4}$$

your turn

$$\frac{3}{6} - \frac{2}{6}$$

$$\frac{1}{6}$$

$$\frac{y}{7} - \frac{5}{7}$$

$$\frac{y-5}{7}$$

$$-\frac{4}{p} - \frac{5}{p}$$

$$\frac{-9}{p}$$

$$\frac{3h}{9} - \frac{7h}{9}$$

$$\frac{-4h}{9}$$

$$-\frac{4}{15} - \left(-\frac{5}{15}\right)$$

$$\frac{1}{15}$$

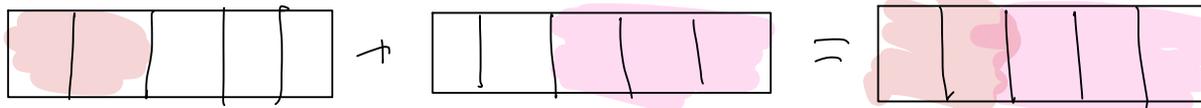
$$\frac{5}{9} - \left(\frac{3}{9}\right) - \frac{7}{9}$$

$$\frac{-5}{9}$$

Add & Subtract Fractions with Common Denominators *Practice*

Use a model to add the fractions. Show a diagram to illustrate your model.

$$1. \frac{2}{5} + \frac{3}{5} = \frac{5}{5} = \textcircled{1}$$



Find the sum.

$$2. \frac{5}{9} + \frac{1}{9} = \frac{6}{9} = \textcircled{\frac{2}{3}}$$

$$3. \frac{9}{15} + \frac{6}{15} = \frac{15}{15} = \textcircled{1}$$

$$4. \frac{y}{13} + \frac{2}{13} = \textcircled{\frac{y+2}{13}}$$

$$5. \frac{8}{x} + \frac{6}{x} = \textcircled{\frac{14}{x}}$$

$$6. \frac{5a}{20} + \frac{4a}{20} = \textcircled{\frac{9a}{20}}$$

$$7. -\frac{11x}{7} + \frac{7x}{7} = \textcircled{\frac{-4x}{7}}$$

$$8. \frac{6}{12} + \left(-\frac{10}{12}\right) + \left(-\frac{11}{12}\right) = \frac{-15+3}{12 \div 3} = \textcircled{\frac{-5}{4}}$$

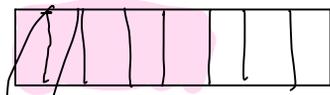
$$9. \frac{5}{15} + \left(-\frac{7}{15}\right) + \left(-\frac{11}{15}\right) = \textcircled{\frac{-13}{15}}$$

Add & Subtract Fractions with Common Denominators Practice

Use a model to subtract the fractions. Show a diagram to illustrate your model.

10. $\frac{5}{8} - \frac{2}{8}$

$\frac{3}{8}$



Find the difference.

11. $\frac{5}{9} - \frac{1}{9}$

$\frac{4}{9}$

12. $\frac{9}{15} - \frac{6}{15}$

$\frac{3}{15} = \frac{1}{5}$

13. $\frac{y}{13} - \frac{2}{13}$

$\frac{y-2}{13}$

14. $\frac{8}{x} - \frac{6}{x}$

$\frac{2}{x}$

15. $\frac{5a}{20} - \frac{4a}{20}$

$\frac{a}{20}$

16. $-\frac{11x}{7} - \frac{7x}{7}$

$-\frac{18x}{7}$

17. $\frac{6}{12} - \left(-\frac{10}{12}\right) + \left(-\frac{11}{12}\right)$

$\frac{5}{12}$

18. $\frac{5}{15} - \left(-\frac{7}{15}\right) + \left(-\frac{11}{15}\right)$

$\frac{1}{15}$