Algebra Readiness

Unit3: Ratios, Fractions, Percents

Algebra Readiness – Fall Outline

Unit	Target #	Learning Target
Unit 1: Numbers and Operations	1	I can add and subtract integers.
	2	I can add and subtract decimals.
	3	I can multiply and divide integers.
	4	I can multiply and divide decimals.
	5	I can find the value of expressions using the order of operations.
Unit 2: Working with Ratios and Fractions	6	I can write, simplify, and find equivalent ratios.
	7	I can add and subtract fractions.
	8	I can multiply and divide fractions.
	9	I can convert between fractions, decimals, and percents.
	10	I can solve real-world percent problems.

Warmups

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Warmups

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Warmups

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6.1: Equivalent Fractions

Equivalent Fractions

1) $\frac{3}{4} = \frac{6}{\_\_} = \frac{9}{\_\_} = \frac{\_\_}{16} = \frac{\_\_}{20} = \frac{18}{\_\_} = \frac{\_\_}{28}$

2) $\frac{3}{5} = \frac{6}{\_\_} = \frac{\_\_}{15} = \frac{12}{\_\_} = \frac{15}{\_\_} = \frac{\_\_}{30} = \frac{21}{\_\_}$

3) $\frac{1}{9} = \frac{2}{\_\_} = \frac{\_\_}{27} = \frac{\_\_}{36} = \frac{\_\_}{45} = \frac{6}{\_\_} = \frac{7}{\_\_}$

4) $\frac{1}{2} = \frac{\_\_}{4} = \frac{3}{\_\_} = \frac{4}{\_\_} = \frac{5}{\_\_} = \frac{6}{\_\_} = \frac{\_\_}{14}$

5) $\frac{2}{3} = \frac{4}{\_\_} = \frac{\_\_}{9} = \frac{8}{\_\_} = \frac{\_\_}{15} = \frac{\_\_}{18} = \frac{\_\_}{21}$

6) $\frac{7}{10} = \frac{\_\_}{20} = \frac{\_\_}{30} = \frac{\_\_}{40} = \frac{\_\_}{50} = \frac{42}{\_\_} = \frac{\_\_}{70}$

7) $\frac{1}{8} = \frac{\_\_}{16} = \frac{3}{\_\_} = \frac{4}{\_\_} = \frac{\_\_}{40} = \frac{\_\_}{48} = \frac{7}{\_\_}$

8) $\frac{1}{7} = \frac{\_\_}{14} = \frac{3}{\_\_} = \frac{4}{\_\_} = \frac{5}{\_\_} = \frac{6}{\_\_} = \frac{7}{\_\_}$

9) $\frac{1}{6} = \frac{2}{\_\_} = \frac{3}{\_\_} = \frac{4}{\_\_} = \frac{\_\_}{30} = \frac{6}{\_\_} = \frac{\_\_}{42}$

10) $\frac{2}{7} = \frac{\_\_}{14} = \frac{\_\_}{21} = \frac{8}{\_\_} = \frac{\_\_}{35} = \frac{12}{\_\_} = \frac{\_\_}{49}$

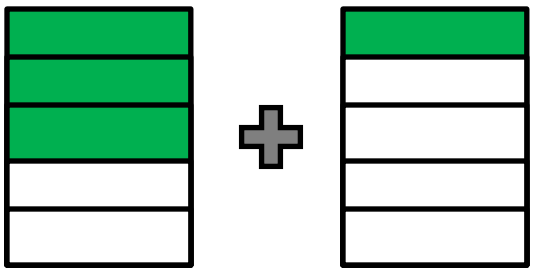
Adding Fractions With Common Denominators

Adding fractions with common denominators is as simple as adding whole numbers.

- Step 1: Add the numerators
- Step 2: Put the new numerator over the original denominator
- Simplify the fraction (if needed)

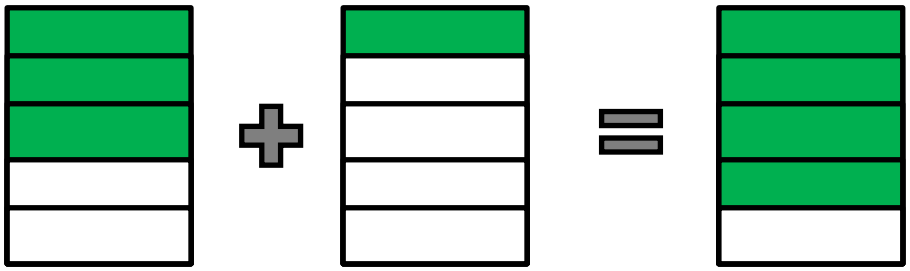
Example:

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



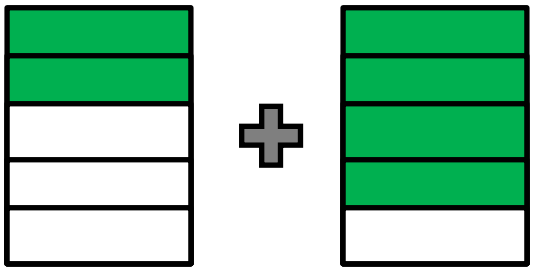
Step 1: Add the numerators.	3 + 1 = 4
Step 2: Put the new numerator over the original denominator.	$\frac{4}{5}$
Step 3: Simplify if needed.	$\frac{4}{5}$ is already a proper fraction in its simplest form, so you are done.

So, $\frac{3}{5} + \frac{1}{5} = \frac{4}{5}$



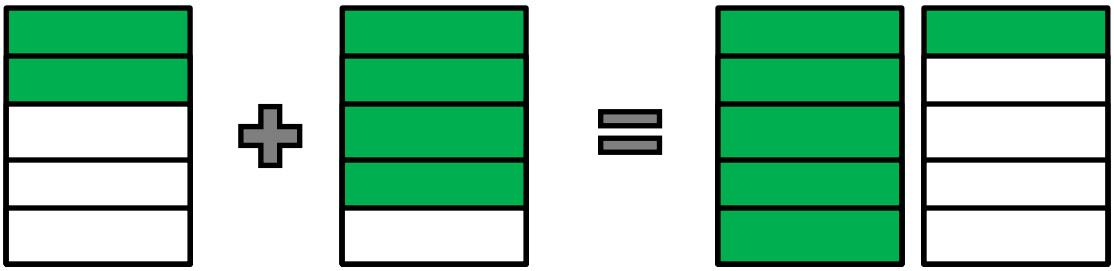
Example:

$$\frac{2}{5} + \frac{4}{5}$$



Step 1: Add the numerators.	2 + 4 = 6
Step 2: Put the new numerator over the original denominator.	$\frac{6}{5}$
Step 3: Simplify if needed.	$\frac{6}{5}$ is the same as $1\frac{1}{5}$

So, $\frac{2}{5} + \frac{4}{5} = 1\frac{1}{5}$



Simplify the following fractions.

$\frac{2}{6}$ = _____ $\frac{8}{3}$ = _____ $\frac{3}{9}$ = _____

$\frac{4}{2}$ = _____ $\frac{5}{10}$ = _____ $\frac{2}{8}$ = _____

7.1 Assignment

Adding Fractions With Common Denominators

Solve. Simplify answers when needed.

$\frac{2}{4}+\frac{1}{4}=$ $\frac{3}{5}+\frac{3}{5}=$ $\frac{5}{8}+\frac{1}{8}=$ $\frac{6}{10}+\frac{2}{10}=$

$\frac{3}{4}+\frac{2}{4}=$ $\frac{1}{3}+\frac{1}{3}=$ $\frac{8}{12}+\frac{6}{12}=$ $\frac{6}{8}+\frac{7}{8}=$

$\frac{5}{9}+\frac{3}{9}=$ $\frac{1}{4}+\frac{1}{4}=$ $\frac{5}{6}+\frac{3}{6}=$ $\frac{2}{5}+\frac{3}{5}=$

$\frac{2}{2}+\frac{1}{2}=$ $\frac{3}{7}+\frac{5}{7}=$ $\frac{6}{9}+\frac{1}{9}=$ $\frac{5}{8}+\frac{5}{8}=$

$\frac{4}{5}+\frac{3}{5}=$ $\frac{2}{10}+\frac{1}{10}=$ $\frac{7}{11}+\frac{3}{11}=$ $\frac{8}{9}+\frac{2}{9}=$

Subtracting Simple Fractions

1) $\frac{4}{5} - \frac{2}{5} =$

2) $\frac{4}{11} - \frac{3}{11} =$

3) $\frac{6}{12} - \frac{3}{12} =$

4) $\frac{2}{12} - \frac{1}{12} =$

5) $\frac{7}{9} - \frac{5}{9} =$

6) $\frac{2}{4} - \frac{1}{4} =$

7) $\frac{3}{8} - \frac{2}{8} =$

8) $\frac{7}{10} - \frac{4}{10} =$

9) $\frac{3}{6} - \frac{2}{6} =$

10) $\frac{3}{10} - \frac{1}{10} =$

Lesson:

E.Q.:

Big Ideas

Wrap-up

7.2 Assignment

Adding Fractions

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

2) $\frac{6}{10} + \frac{3}{5} =$

3) $\frac{5}{10} + \frac{3}{4} =$

4) $\frac{6}{10} + \frac{2}{4} =$

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

6) $\frac{3}{5} + \frac{2}{3} =$

7) $\frac{2}{3} + \frac{9}{10} =$

8) $\frac{2}{3} + \frac{8}{10} =$

9) $\frac{1}{10} + \frac{1}{3} =$

10) $\frac{1}{2} + \frac{3}{5} =$

Subtracting Fractions

1) $\frac{2}{4} - \frac{1}{3} =$

2) $\frac{4}{5} - \frac{4}{10} =$

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

4) $\frac{1}{2} - \frac{1}{5} =$

5) $\frac{2}{4} - \frac{1}{2} =$

6) $\frac{7}{10} - \frac{1}{3} =$

7) $\frac{8}{10} - \frac{2}{4} =$

8) $\frac{9}{10} - \frac{1}{5} =$

9) $\frac{2}{3} - \frac{3}{10} =$

10) $\frac{2}{3} - \frac{1}{10} =$

Lesson:

E.Q.:

Big Ideas

Wrap-up

8.1 Assignment

Multiplying Fractions

1) $\frac{1}{8} \times \frac{3}{5} =$

2) $\frac{6}{8} \times \frac{2}{4} =$

3) $\frac{7}{9} \times \frac{1}{8} =$

4) $\frac{6}{10} \times \frac{2}{5} =$

5) $\frac{1}{2} \times \frac{3}{9} =$

6) $\frac{5}{8} \times \frac{3}{9} =$

7) $\frac{2}{4} \times \frac{2}{3} =$

8) $\frac{1}{2} \times \frac{3}{10} =$

9) $\frac{4}{5} \times \frac{3}{7} =$

10) $\frac{2}{4} \times \frac{5}{10} =$

8.2 Assignment

Lesson 5.2T ~ Multiplying Rational Numbers

Name_____ Period_____ Date_____

Find each product. Write in simplest form.

1. $-\frac{1}{4}\left(-\frac{2}{3}\right) \longrightarrow \frac{-1}{4}\left(\frac{-2}{3}\right)$

Rewrite with the negatives in the numerator.

2. $-\frac{3}{5} \cdot \frac{1}{4}$

+	·	+	=	+
−	·	−	=	+
+	·	−	=	−
−	·	+	=	−

3. $-\frac{5}{2}\left(-2\frac{1}{4}\right)$

4. $-\frac{2}{3}\left(-\frac{9}{4}\right)$

5. $\frac{3}{8}\left(-\frac{5}{7}\right)$

6. $\frac{3}{2}\left(-\frac{8}{5}\right)$

11. Alden measured the water level in his pool each day. Every day, the water level went down $1\frac{1}{2}$ inches. He measured the pool for 5 straight days.

a. Which value in this situation could be represented by a negative number? _____ Why?

b. Write a multiplication expression to determine the rational number that represents the total change in the pool after 5 days.

$\square \cdot \square =$

c. Find the value of your expression from **part b**.

Lesson:

E.Q.:

Big Ideas

Wrap-up

8.3 Assignment

Dividing Fractions and Whole Numbers

1) $\frac{1}{2} \div 9 =$

2) $6 \div \frac{2}{3} =$

3) $\frac{4}{5} \div 5 =$

4) $\frac{1}{2} \div 10 =$

5) $\frac{2}{4} \div 10 =$

6) $2 \div \frac{1}{5} =$

7) $\frac{1}{4} \div 6 =$

8) $\frac{4}{10} \div 8 =$

9) $\frac{5}{10} \div 5 =$

10) $5 \div \frac{2}{3} =$

8.4 Assignment

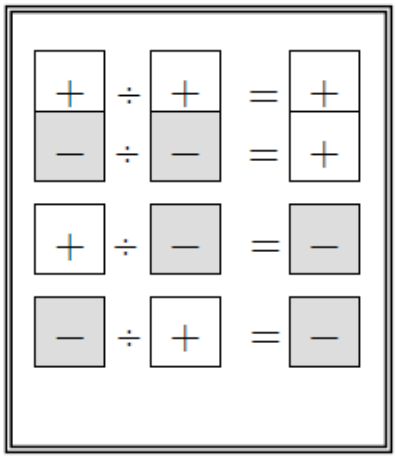
Lesson 5.3T ~ Dividing Rational Numbers

Name_____ Period_____ Date_____

Find each quotient. Write in simplest form.

1. $\frac{2}{5} \div \left(-\frac{1}{5}\right)$

Use the chart to determine the sign of the quotient.



2. $-\frac{3}{4} \div \left(-\frac{5}{8}\right)$

3. $5 \div \left(-\frac{2}{3}\right)$

4. $2 \div \frac{2}{5}$

5. $-3 \div \left(\frac{6}{5}\right)$

6. $-\frac{3}{4} \div 4$

7. Cally feeds her cat the same amount of food every day. Over the past 3 days, her bag of cat food has decreased by $1\frac{4}{5}$ cups.

   a. Which value in this situation should be represented by a negative number? _____ Why?

   b. Write a division expression to find the number that represents the change in the amount of food in the bag each day.

   ☐ ÷ ☐ = ☐

   c. Find the value of your expression from **part b**.

8.5 Assignment

Lesson 5.2 ~ Multiplying Rational Numbers

Name_____ Period_____ Date_____

Find each product. Write in simplest form.

1. $-\frac{2}{3}\left(-\frac{1}{5}\right)$

2. $-\frac{4}{7}\cdot\frac{3}{4}$

3. $-1\frac{3}{4}\left(-2\frac{1}{7}\right)$

4. $-2\frac{2}{5}\left(3\frac{1}{2}\right)$

5. $\frac{5}{8}\left(-\frac{2}{15}\right)$

6. $6\frac{2}{3}\left(3\frac{3}{10}\right)$

7. Asher sat on the beach while the tide went out. Every minute, the tide went out $2\frac{2}{3}$ feet. He watched the tide go out for $4\frac{1}{2}$ minutes.

   a. Which value in this situation could be represented by a negative number? _____ Why?

   b. Write a multiplication expression to determine the rational number that represents the total change in the tide after $4\frac{1}{2}$ minutes.

   c. Find the value of your expression from **part b**.

Lesson 5.3 ~ Dividing Rational Numbers

Name_____ Period____ Date_____

Find each quotient. Write in simplest form.

1. $\frac{3}{5} \div \left(-\frac{1}{5}\right)$

2. $-\frac{3}{4} \div \left(-\frac{7}{8}\right)$

3. $7 \div \left(-\frac{1}{3}\right)$

4. $5\frac{1}{6} \div \frac{1}{3}$

5. $6 \div \left(3\frac{1}{3}\right)$

6. $\frac{1}{2} \div \left(4\frac{3}{8}\right)$

7. Carol feeds her bird the same amount of food every day. Over the past 7 days, her bag of bird food has decreased by $1\frac{3}{4}$ cups.

   a. Which value in this situation should be represented by a negative number? _____ Why?

   b. Write a division expression to find the number that represents the change in the amount of food in the bag each day.

   c. Find the value of your expression from part b

Lesson:

E.Q.:

Big Ideas

Wrap-up

This activity is about converting between fractions, decimals and percentages.

Information sheet

Converting between decimals and fractions

To change a decimal to a fraction: use the place value of the last digit

For example $0.85 = \frac{85}{100} = \frac{17}{20}$ (÷ 5 top and bottom; 0.85 is hundredths)

On a calculator press: 85 $a\,^b\!/_c$ 100 =

To change a fraction to a decimal: divide the top by the bottom

For example $\frac{4}{5} = 4 \div 5 = 0.8$

Converting between percentages and fractions or decimals

To write a % as a fraction or decimal: divide by 100

For example 64% = 64 ÷ 100 = 0.64

or $64\% = \frac{64}{100} = \frac{16}{25}$

On a calculator press: 64 $a\,^b\!/_c$ 100 =

To write a decimal or fraction as a %: multiply by 100

For example 0.125 = 0.125 × 100 = 12.5%

$\frac{2}{5} = \frac{2}{5} \times 100$ (i.e. $\frac{2}{5}$ of 100%) = 40%

or $\frac{2}{5} = 2 \div 5 \times 100 = 40\%$

On a calculator press: 2 $a\,^b\!/_c$ 5 × 100 = 40%

Try these

1 Write these decimals as fractions:

0.3 = ……. 0.5 = ……. 0.6 = ……. 0.02 = …….

0.05 = ……. 0.25 = ……. 0.36 = ……. 0.125 = …….

2 Write these fractions as decimals:

$\frac{7}{10}$ = ……. $\frac{1}{5}$ = ……. $\frac{2}{5}$ = ……. $\frac{3}{4}$ = …….

$\frac{7}{8}$ = ……. $\frac{2}{3}$ = ……. $\frac{9}{20}$ =……. $\frac{7}{25}$ = …….

3 Write these percentages as decimals:

3% = ……. 30% = ……. 25% = ……. 80% = …….

8% = ……. 12% = ……. 67% = ……. 17.5% = …….

4 Write these percentages as fractions:

20% = ……. 75% = ……. 5% = ……. 30% = …….

40% = ……. 15% = ……. 24% = ……. 35% = …….

5 Write these decimals as percentages:

0.25 = ……. 0.5 = ……. 0.7 = ……. 0.07 = …….

0.45 = ……. 0.09 = ……. 0.4 = ……. 0.375 = …….

6 Write these fractions as percentages:

$\frac{1}{10}$ = ……. $\frac{1}{5}$ = ……. $\frac{9}{10}$ = ……. $\frac{3}{4}$ = …….

$\frac{4}{5}$ = ……. $\frac{17}{20}$ = ……. $\frac{1}{3}$ = ……. $\frac{2}{3}$ = …….

Fractions to decimals to percentages

Complete this table.

Fraction	Decimal	Percentage
$\frac{1}{10}$		
$\frac{1}{5}$		
$\frac{3}{10}$		
$\frac{2}{5}$		
$\frac{1}{2}$		
$\frac{3}{5}$		
$\frac{7}{10}$		
$\frac{4}{5}$		
$\frac{9}{10}$		
$\frac{1}{4}$		
$\frac{3}{4}$		

Fill the gaps in the table.

Percentage	Fraction	Decimal
10%		
		0.2
	$\frac{3}{10}$	
40%		
		0.5
	$\frac{3}{5}$	
70%		
		0.8
	$\frac{9}{10}$	
25%		
	$\frac{3}{4}$	

Lesson 3.1T ~ Fractions, Decimals and Percents

Name_____ Period_____ Date_____

Convert each fraction or mixed number to a decimal.

1. $\frac{1}{2}$ **2.** $\frac{7}{10}$ **3.** $2\frac{1}{4}$

4. $\frac{3}{4}$ **5.** $\frac{1}{10}$ **6.** $\frac{4}{5}$

7. $\frac{1}{8}$ **8.** $\frac{1}{3}$ **9.** $\frac{1}{5}$

Convert each decimal to a fraction.

10. 0.5 **11.** 0.1 **12.** 0.75

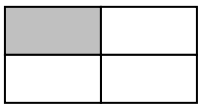
13. 0.2 **14.** 2.25 **15.** 0.125

16. $0.\overline{3}$ **17.** 0.8 **18.** 0.7

***********Check your work: Each answer for #10-18 should match a fraction in #1-9.***********

Write the shaded portion of each picture as a fraction and as a decimal.

19.

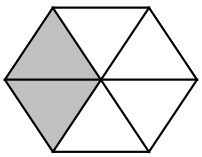


number of rectangles shaded = _____

total number of rectangles = _____

Answer: _____ , _____

20.



number of triangles shaded = _____

total number of triangles = _____

Answer: _____ , _____

Write each percent as a fraction in simplest form. Write each as a decimal.

21. 50%

Fraction: $\frac{\quad}{100}$ =

Decimal:

22. 25%

Fraction:

Decimal:

23. 10%

Fraction:

Decimal:

24. 90%

Fraction:

Decimal:

25. 15%

Fraction:

Decimal:

26. 150%

Fraction:

Decimal:

Write each decimal as a percent.

27. 0.75

28. 0.05

29. 0.2

Write each fraction as a percent.

30. $\frac{50}{100}$

31. $\frac{7}{10}$

32. $\frac{1}{4}$

33. Isaac read that 30% of people owned dogs.

a. What fraction of people own dogs?

b. What decimal of people own dogs?

Lesson:

E.Q.:

Big Ideas

Wrap-up