

# Unit 2 - Operations with Rational Numbers

## Topics

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Fractions and Decimals

The Real Number System

Rational Numbers

Converting to Equivalent Forms

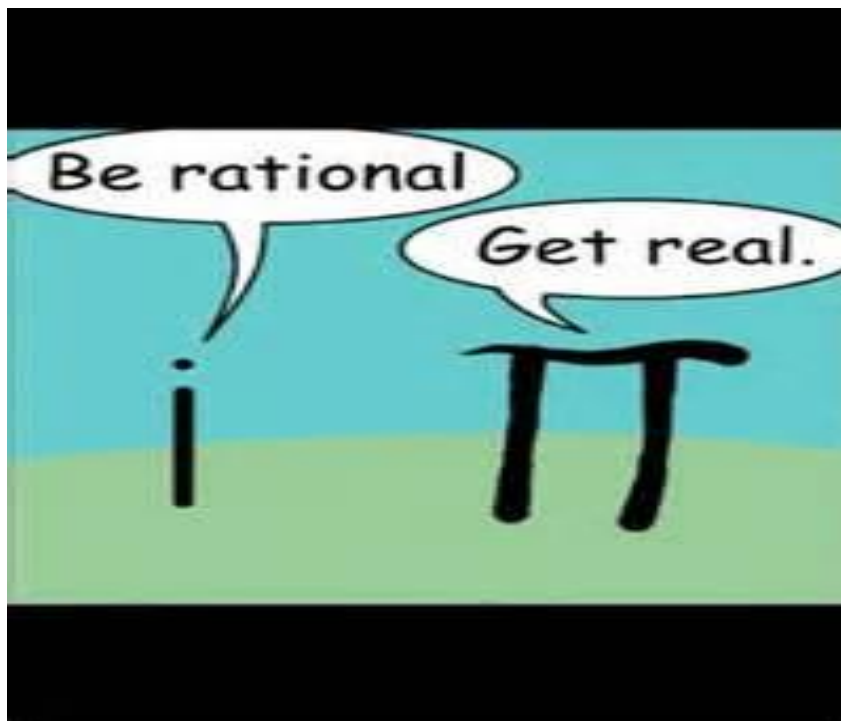
Putting Numbers on a Number Line

Multiplying Rational Numbers

Dividing Rational Numbers

Adding & Subtracting Like Fractions

Adding & Subtracting Unlike Fractions



Name: \_\_\_\_\_

Team: \_\_\_\_\_ Math Period: \_\_\_\_\_ Teacher: \_\_\_\_\_



# Lesson 1 Homework Practice

## Fractions and Decimals

Write each fraction as a decimal. Use a bar to show a repeating decimal.

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

2.  $\frac{1}{8}$

3.  $\frac{9}{11}$

4.  $-\frac{3}{16}$

5.  $\frac{3}{40}$

6.  $\frac{8}{11}$

7.  $\frac{5}{12}$

8.  $\frac{1}{3}$

9.  $\frac{7}{9}$

10.  $-\frac{11}{15}$

11.  $-\frac{12}{16}$

12.  $\frac{13}{60}$

13.  $\frac{1}{45}$

14.  $-\frac{5}{24}$

15.  $\frac{13}{20}$

16.  $\frac{17}{18}$

17.  $-\frac{2}{3}$

18.  $\frac{7}{8}$

Replace each  $\bullet$  with  $<$ ,  $>$ , or  $=$  to make a true sentence.

19.  $-\frac{13}{2} \bullet -6.4$

20.  $\frac{6}{7} \bullet \frac{5}{6}$

21.  $-0.75 \bullet -\frac{15}{20}$

22.  $-\frac{3}{8} \bullet -0.40$

23.  $\frac{7}{8} \bullet \frac{8}{9}$

24.  $-\frac{33}{100} \bullet -0.\bar{3}$

25. Order  $\frac{4}{9}$ ,  $\frac{444}{1000}$ , and 0.4 from least to greatest.

26. Order  $-\frac{8}{9}$ ,  $-\frac{8}{10}$ , and  $-0.\bar{80}$  from least to greatest.

27. In a school survey, 787 out of 1000 students preferred hip-hop music to techno. Is this figure more or less than  $\frac{7}{9}$  of those surveyed? Explain.

# Lesson 7 Homework Practice

## The Real Number System

Name all sets of numbers to which each real number belongs. Write *natural*, *whole*, *integer*, *rational*, or *irrational*.

1. 15

2.  $-41$

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

4.  $\frac{1}{3}$

5.  $0.212121\dots$

6.  $\sqrt{8}$

7.  $\sqrt{45}$

8.  $\frac{36}{9}$

9.  $-\frac{28}{7}$

10. 2.31

11. 45.6

12.  $0.090090009\dots$

Determine whether each statement is *always*, *sometimes*, or *never* true.

13. A decimal number is an irrational number.

14. An integer is a whole number.

15. A whole number is an integer.

16. A negative integer is a whole number.

Replace each  $\bullet$  with  $<$ ,  $>$ , or  $=$  to make a true sentence.

17.  $3.2 \bullet \sqrt{9.5}$

18.  $1\frac{1}{2} \bullet \sqrt{3}$

19.  $\sqrt{17} \bullet 4.1$

20.  $\sqrt{7.84} \bullet 2.8$

21.  $1\frac{3}{4} \bullet \sqrt{3.0625}$

22.  $3.67 \bullet \sqrt{12}$

Order each set of numbers from least to greatest.

23.  $\sqrt{49}$ ,  $6\overline{91}$ ,  $7\frac{1}{8}$ ,  $\frac{15}{2}$

24.  $4\frac{1}{3}$ ,  $\sqrt{43}$ ,  $\frac{12}{3}$ , 4.13

25.  $-2$ ,  $-1.5$ ,  $-1\frac{8}{10}$ ,  $-\sqrt{6}$

Solve each equation. Round to the nearest tenth, if necessary.

26.  $h^2 = 361$

27.  $k^2 = 10.24$

28.  $c^2 = 111$

29.  $729 = t^3$

30.  $0.089 = u^2$

31.  $w^3 = -0.027$

32. Ray planted a square garden that covers an area of  $200 \text{ ft}^2$ . How many feet of fencing does he need to surround the garden? Round to the nearest tenth.

## Lesson 2 Homework Practice

### *Rational Numbers*

Write each number as a fraction.

1. 29

2. 0

3.  $3\frac{7}{8}$

4.  $-47$

5.  $-5\frac{6}{7}$

6.  $4\frac{3}{20}$

7.  $-7\frac{2}{15}$

8.  $10\frac{2}{9}$

9. 15

Write each decimal as a fraction or mixed number in simplest form.

10. 0.32

11. 0.42

12.  $0.\overline{8}$

13.  $-6.\overline{3}$

14. 0.91

15. 17.875

16.  $-0.666\dots$

17.  $0.\overline{07}$

18.  $9.\overline{7}$

19.  $7.\overline{75}$

20. 0.525

21.  $-8.26$

22.  $6.\overline{5}$

23.  $-4.12$

24. 13.006

Identify all sets to which each number belongs.

25. 15

26.  $-3.\overline{8}$

27.  $-5.075$

28.  $\frac{50}{25}$

29.  $\pi$

30.  $-\frac{4}{2}$

31. The smallest flowering plant is the flowering aquatic duckweed found in Australia. It is 0.0236 inch long and 0.0129 inch wide. Write these dimensions as fractions in simplest form.

Name \_\_\_\_\_

Date \_\_\_\_\_

## Equivalent Forms

1. Complete the Chart.

Fraction	Decimal	Percent
$\frac{3}{5}$		
	0.375	
		70%
	0.8	
		125%
$\frac{2}{3}$		

2. Write each percent as a decimal.

a) 23% \_\_\_\_\_      b) 9.1% \_\_\_\_\_      c) 275% \_\_\_\_\_

3. Change each of the following to a percent.

a) 0.37 \_\_\_\_\_      b) 1.4 \_\_\_\_\_      c) 0.059 \_\_\_\_\_

4. Change each percent to a fraction in lowest terms.

a) 2% \_\_\_\_\_ b) 79% \_\_\_\_\_ c) 25% \_\_\_\_\_

5. Without calculating, write each fraction as a decimal and as a percent.

a)  $\frac{2}{5}$  \_\_\_\_\_, \_\_\_\_\_ b)  $\frac{3}{4}$  \_\_\_\_\_, \_\_\_\_\_

c)  $\frac{1}{3}$  \_\_\_\_\_, \_\_\_\_\_

6. Without calculating, write each decimal as a fraction and as a percent.

a) 0.375 \_\_\_\_\_, \_\_\_\_\_ b) 0.1 \_\_\_\_\_, \_\_\_\_\_

c) 0.25 \_\_\_\_\_, \_\_\_\_\_

7. Without calculating, write each percent as a fraction and as a decimal.

a) 50% \_\_\_\_\_, \_\_\_\_\_ b) 10% \_\_\_\_\_, \_\_\_\_\_

c) 33% \_\_\_\_\_, \_\_\_\_\_

8. Write each of the following as a percent.

a)  $\frac{29}{100}$  \_\_\_\_\_ b) thirty-one hundredths \_\_\_\_\_

c) One hundred one hundredths \_\_\_\_\_

9. Use the  $<$ ,  $=$ , or  $>$  to make each comparison a true statement.

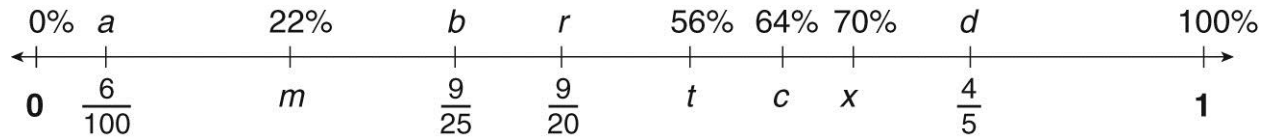
a) 55% \_\_\_\_\_ 1 b)  $\frac{517}{100}$  \_\_\_\_\_ 5.07 c) 3.07 \_\_\_\_\_ 307%

**LESSON**  
**6-1**

## Comparing and Ordering Rational Numbers

### Relating Decimals, Fractions, and Percents

Find the missing ratio or percent equivalent for each letter on the number line.



- |             |             |             |             |
|-------------|-------------|-------------|-------------|
| 1. <i>a</i> | 2. <i>b</i> | 3. <i>c</i> | 4. <i>d</i> |
| _____       | _____       | _____       | _____       |
| 5. <i>m</i> | 6. <i>r</i> | 7. <i>t</i> | 8. <i>x</i> |
| _____       | _____       | _____       | _____       |

Compare. Write  $<$ ,  $>$ , or  $=$ .

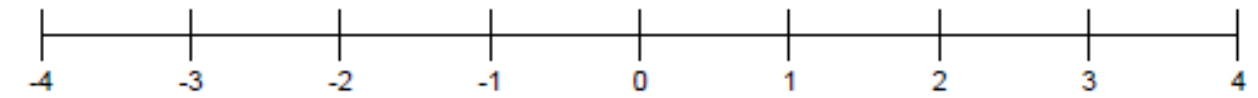
- |                          |                           |                    |
|--------------------------|---------------------------|--------------------|
| 9. $\frac{3}{4}$ ___ 70% | 10. 60% ___ $\frac{3}{5}$ | 11. 58% ___ 0.6    |
| 12. 0.09 ___ 15%         | 13. $\frac{2}{3}$ ___ 59% | 14. 0.45 ___ 40.5% |

Order the numbers from least to greatest.

- |                                      |                                    |
|--------------------------------------|------------------------------------|
| 15. 99%, 0.95, $\frac{5}{9}$ , 9.5%  | 16. $\frac{3}{8}$ , 50%, 0.35, 38% |
| _____                                | _____                              |
| 17. $\frac{4}{5}$ , 54%, 0.45, 44.5% | 18. $\frac{1}{3}$ , 20%, 0.3, 3%   |
| _____                                | _____                              |

19. Place the following values on the appropriate spaces on the number line.

- a) 90%      b) -1.3      c)  $\frac{\pi}{2}$       d)  $\sqrt{0.25}$       e)  $\frac{16}{5}$       f)  $2\frac{3}{8}$



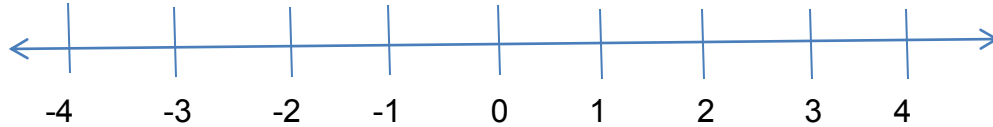


### Placing Number on a Number Line

Place the following values on the appropriate spaces on the number line.

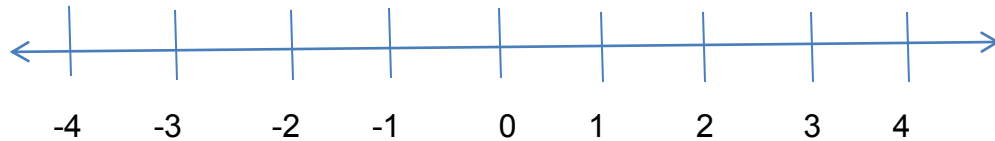
1.

- a) 90%      b) -1.3      c)  $\pi$       d)  $\sqrt{3}$       e)  $\frac{10}{-5}$       f)  $2\frac{3}{8}$



2.

- a) 150%      b) 1.78      c)  $-\pi$       d)  $\sqrt{11}$       e)  $\frac{14}{7}$       f)  $\frac{2}{3}$



3.

- a) -50%      b) 0.78      c)  $-1\frac{1}{4}$       d)  $-\sqrt{9}$       e)  $\frac{10}{3}$       f)  $\frac{1}{9}$



# Lesson 3 Homework Practice

## Multiplying Rational Numbers

Find each product. Write in simplest form.

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

2.  $\frac{3}{7} \cdot \frac{21}{39}$

3.  $-\frac{3}{4} \cdot \frac{10}{27}$

4.  $\frac{11}{14} \cdot \frac{7}{33}$

5.  $-\frac{18}{24} \cdot \frac{3}{4}$

6.  $\frac{9}{10} \cdot \frac{20}{21}$

7.  $-50 \cdot \frac{3}{1000}$

8.  $\frac{16}{17} \cdot \left(-\frac{5}{8}\right)$

9.  $-\frac{1}{2} \cdot \left(-\frac{20}{27}\right)$

10.  $-\frac{14}{15} \cdot \left(-\frac{10}{28}\right)$

11.  $4\frac{4}{7} \cdot 9\frac{1}{3}$

12.  $-2\frac{14}{25} \cdot \frac{3}{8}$

13.  $4\frac{1}{8} \cdot \left(-1\frac{5}{11}\right)$

14.  $-5 \cdot \frac{17}{25}$

15.  $2\frac{9}{10} \cdot 1\frac{1}{5}$

16.  $\frac{6m}{13} \cdot \frac{2}{mn}$

17.  $\frac{p}{3} \cdot \frac{1}{q}$

18.  $\frac{2u}{v^2} \cdot \frac{3}{u}$

19.  $\frac{4x}{3y} \cdot \frac{9y}{2x}$

20.  $\frac{2a}{b} \cdot \frac{c}{2d}$

21.  $\frac{rs}{9t} \cdot \frac{3}{s^2}$

22.  $2x \cdot \frac{1}{4x^2}$

23.  $\frac{x^2}{4y} \cdot \frac{16y^2}{3x}$

24.  $\frac{2}{r} \cdot \frac{3}{r}$

Evaluate each expression if  $a = -\frac{5}{6}$ ,  $b = -3\frac{3}{8}$ , and  $c = \frac{7}{10}$ . Write the product in simplest form.

25.  $bc$

26.  $ac$

27.  $4\frac{2}{5}c$

28.  $-2abc$

29.  $-3\frac{3}{7}ab$

30.  $2\frac{1}{9}abc$

31. The fastest retired airliner, the Concorde, had the capability of cruising at speeds of up to 1450 mph. While cruising at this top speed, how far would the Concorde travel in  $2\frac{1}{2}$  hours?

# Lesson 4 Homework Practice

## Dividing Rational Numbers

Find each quotient. Write in simplest form.

1.  $\frac{1}{2} \div \frac{1}{10}$

2.  $-\frac{3}{8} \div \frac{9}{24}$

3.  $-\frac{15}{16} \div \frac{7}{12}$

4.  $\frac{17}{20} \div \left(-\frac{3}{10}\right)$

5.  $-\frac{3}{8} \div \left(-\frac{3}{9}\right)$

6.  $\frac{25}{32} \div \frac{15}{56}$

7.  $0 \div \frac{17}{18}$

8.  $-1\frac{1}{2} \div \frac{1}{4}$

9.  $\frac{8}{9} \div \frac{22}{81}$

10.  $8\frac{4}{9} \div 2\frac{1}{9}$

11.  $4\frac{3}{5} \div \frac{2}{5}$

12.  $-\frac{100}{63} \div \frac{10}{81}$

13.  $18\frac{1}{3} \div \left(-4\frac{1}{6}\right)$

14.  $-3\frac{2}{9} \div \frac{4}{27}$

15.  $-2\frac{5}{6} \div \frac{3}{51}$

16.  $4\frac{11}{12} \div 4\frac{5}{6}$

17.  $\frac{2x}{3} \div \frac{1}{9}$

18.  $\frac{a}{4} \div \frac{a}{8}$

19.  $\frac{4k}{5} \div \frac{25}{2k}$

20.  $\frac{ab}{8} \div \frac{b}{a}$

21.  $\frac{2c}{b} \div \frac{4a}{b}$

22.  $\frac{y}{x} \div y^2$

23.  $\frac{3st}{r} \div \frac{4t}{r}$

24.  $\frac{a^2}{b^2} \div \frac{c^2}{b^2}$

25.  $-\frac{2x}{y} \div \frac{4}{y}$

26.  $\frac{m^2}{2np} \div \frac{n}{4p}$

27. Evaluate  $x \div y$  if  $x = 3\frac{1}{2}$  and  $y = \frac{3}{4}$ .

28. Evaluate  $w \div z$  if  $w = \frac{6}{7}$  and  $z = 3$ .

29. What is the average speed that Robin must drive to reach her friend's house 170 miles away in  $2\frac{1}{2}$  hours?

30. How many choir robes can be made from  $20\frac{1}{4}$  yards of fabric if each robe needs  $1\frac{1}{8}$  yards?

# Lesson 5 Homework Practice

## *Adding and Subtracting Like Fractions*

Find each sum or difference. Write in simplest form.

1.  $\frac{5}{7} + \frac{2}{7}$

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

3.  $\frac{13}{20} - \frac{3}{20}$

4.  $\frac{5}{16} + \frac{15}{16}$

5.  $-\frac{19}{40} + \frac{21}{40}$

6.  $-\frac{7}{9} - \frac{4}{9}$

7.  $\frac{14}{23} - \frac{16}{23}$

8.  $\frac{25}{36} + \left(-\frac{7}{36}\right)$

9.  $\frac{21}{25} + \frac{9}{25}$

10.  $10\frac{4}{7} + 11\frac{5}{7}$

11.  $9\frac{3}{8} + 4\frac{1}{8}$

12.  $-8\frac{7}{10} + 2\frac{3}{10}$

13.  $23\frac{17}{20} - 4\frac{7}{20}$

14.  $22\frac{3}{8} - 18\frac{5}{8}$

15.  $7\frac{9}{10} + 3\frac{3}{10}$

16.  $6\frac{1}{6} - 3\frac{5}{6}$

17.  $5\frac{1}{4} + 3\frac{1}{4} + 9\frac{3}{4}$

18.  $6\frac{7}{8} + \left(-7\frac{3}{8}\right)$

Find the distance between each set of points. Simplify, if necessary.

19.  $\frac{1}{4}$  and  $\frac{3}{4}$

20.  $-\frac{1}{10}$  and  $-\frac{7}{10}$

21.  $\frac{13}{15}$  and  $\frac{11}{15}$

22.  $-\frac{1}{9}$  and  $\frac{2}{9}$

23. Matt plans to paste a picture that is  $6\frac{7}{8}$  inches wide on a sheet of paper that is  $8\frac{4}{8}$  inches wide. If he wants to have at least  $\frac{5}{8}$  inch of margin on each side, will the picture fit? Explain.

## Lesson 6 Homework Practice

### *Adding and Subtracting Unlike Fractions*

Find each sum or difference. Write in simplest form.

1.  $\frac{9}{10} + \frac{1}{2}$

2.  $\frac{7}{8} + \frac{1}{10}$

3.  $-\frac{3}{4} + \frac{5}{16}$

4.  $\frac{4}{5} - \frac{2}{6}$

5.  $\frac{5}{8} - \frac{3}{16}$

6.  $\frac{1}{3} + \frac{5}{36}$

7.  $\frac{7}{10} - \frac{14}{100}$

8.  $\frac{17}{21} - \frac{4}{6}$

9.  $\frac{11}{14} - \frac{1}{6}$

10.  $\frac{4}{15} - \left(-\frac{3}{12}\right)$

11.  $\frac{7}{15} + \frac{3}{6}$

12.  $-\frac{7}{8} + \frac{9}{10}$

13.  $10\frac{1}{2} + 7\frac{1}{3}$

14.  $7\frac{1}{2} - 2\frac{7}{10}$

15.  $8\frac{1}{6} + 5\frac{3}{4}$

16.  $7\frac{7}{12} - 5\frac{1}{3}$

17.  $6\frac{4}{5} + \left(-2\frac{3}{8}\right)$

18.  $16\frac{3}{5} + 3\frac{11}{15}$

19.  $18\frac{3}{5} - 7\frac{1}{4}$

20.  $12\frac{2}{7} - 3\frac{5}{6}$

21.  $2\frac{5}{8} + 6\frac{3}{4}$

22.  $29\frac{8}{33} + \left(-3\frac{1}{3}\right)$

23.  $-6\frac{2}{7} - 5\frac{3}{14}$

24.  $-16\frac{2}{7} - 3\frac{20}{21}$

25.  $-10\frac{1}{9} + 9\frac{7}{45}$

26.  $\frac{1}{3} + \frac{5}{6} + \frac{1}{2}$

27.  $9\frac{2}{7} - 11\frac{18}{21}$

28.  $-17\frac{2}{3} - \left(-5\frac{4}{18}\right)$

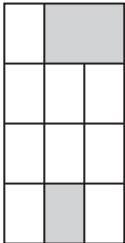
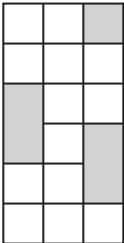
29.  $11\frac{3}{16} - 5\frac{1}{12}$

30.  $\frac{64}{143} - \frac{21}{208}$

31. The inseam on Juan's pants is  $34\frac{1}{4}$  inches. If he has them shortened by  $2\frac{7}{8}$  inches, what is the new length?

# Lesson 1 Problem-Solving Practice

## Fractions and Decimals

<p>1. Ted pays <math>\frac{2}{7}</math> of his salary in taxes, while Carl pays <math>\frac{5}{16}</math> of his salary in taxes. Who pays more of his salary in taxes?</p>	<p>2. Jan and Bob are classifying rocks in geology class. They begin the classification by finding the weight of each rock. Jan's rock weighs <math>\frac{6}{100}</math> kg while Bob's weighs 0.016 kg. Whose rock is heavier?</p>
<p>3. The two lots in the diagram below are subdivided equally by the lines shown. The shaded areas in each lot have been set aside for housing.</p> <div style="display: flex; justify-content: space-around; align-items: center;"> <div style="text-align: center;">  <p>Northfield</p> </div> <div style="text-align: center;">  <p>Southfield</p> </div> </div> <p>Which of the two lots, Northfield or Southfield, has the greater area of land set aside for housing?</p>	<p>4. Petra earned scores of <math>\frac{30}{32}</math>, <math>\frac{29}{31}</math>, and <math>\frac{28}{30}</math> on her last three English quizzes. Find each score as a decimal rounded to the nearest thousandth. Then arrange the fractions in order from least to greatest.</p>
<p>5. Angie is mixing together yellow paint and blue paint to make 2 shades of green paint. She fills <math>\frac{4}{9}</math> of can A with yellow paint, and she fills 0.46 of can B with yellow paint. She then fills the rest of each can with blue paint. In which can will Angie pour more yellow paint?</p>	<p>6. Angie can paint one room with <math>\frac{2}{3}</math> of a canister of one shade of green paint. She will need <math>\frac{5}{8}</math> of a canister of the same shade of green paint for a second room. Does Angie have enough of this shade of green paint to finish the second room? If not, how much additional paint will she need? Express your answer in decimal form.</p>

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# Lesson 2 Problem-Solving Practice

## Rational Numbers

<p>1. One weekend, Nate compared his history homework to his younger sister Caroline's social studies homework. He found that for every <math>2\frac{1}{3}</math> pages he had to read for homework, Caroline had to read one page for homework. How many pages did Nate read for every three pages Caroline read?</p>	<p>2. One foot is equivalent to 30.48 centimeters. Write this value as a mixed number in simplest form.</p>				
<p>3. Earth has a surface area of approximately 197,000,000 square miles and a total land area of approximately 58,000,000 square miles. What fraction of the Earth's surface is land? Write another fraction that is close to your answer and has a denominator of 10.</p>	<p>4. Use the table of 6-ounce yogurt prices to answer the questions below.</p> <table border="1"> <tbody> <tr> <td><b>Yogurt A</b></td> <td>7 for \$4.00</td> </tr> <tr> <td><b>Yogurt B</b></td> <td>\$0.55 each</td> </tr> </tbody> </table> <p>What is the unit price for Yogurt A expressed as a fraction? Which yogurt is the better deal?</p>	<b>Yogurt A</b>	7 for \$4.00	<b>Yogurt B</b>	\$0.55 each
<b>Yogurt A</b>	7 for \$4.00				
<b>Yogurt B</b>	\$0.55 each				
<p>5. Jade is studying fractions and decimals in her math class. While working on homework one night, she noticed a pattern when she wrote each of the following decimals as fractions: <math>0.\overline{5}</math>, <math>0.\overline{7}</math>, <math>0.\overline{28}</math>, and <math>0.\overline{71}</math>. Write each of Jade's decimals as fractions.</p>	<p>6. Refer to the information in Exercise 5. Use Jade's pattern to predict how to write <math>0.\overline{416}</math> as a fraction. Check your answer using a different method.</p>				

## Lesson 3 Problem-Solving Practice

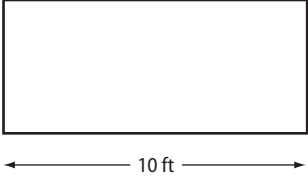
### *Multiplying Rational Numbers*

<p>1. In a school survey, Randy found that <math>\frac{5}{12}</math> of the students normally wear sneakers, and that <math>\frac{8}{25}</math> of those who wear sneakers normally wear white sneakers. What fraction of the student body normally wears white sneakers?</p>	<p>2. The Darling Downs Rabbit Board fence was built to prevent the spread of rabbits into southern Queensland, Australia. On a map drawn to a scale of 1 in. = <math>70\frac{6}{7}</math> m, the fence measures <math>8\frac{3}{4}</math> inches. How long is the actual fence?</p>
<p>3. A farmer has a 420-acre farm. He planted <math>\frac{7}{12}</math> of it with corn, but later found that <math>\frac{3}{14}</math> of the crop was diseased. How many acres of healthy corn did the farmer have?</p>	<p>4. A <math>62\frac{1}{2}</math>-pound bag of concrete mix has <math>\frac{3}{5}</math> of its weight made up of sand and small stones. The stones make up <math>\frac{1}{4}</math> of the weight. What is the weight of the stones in the bag of concrete?</p>
<p>5. A wall in a museum measures 3 meters high by 6 meters wide. One quarter of the wall is dedicated to displays. What is the area of the wall that is dedicated to displays?</p>	<p>6. Refer to the information in Exercise 5. Three paintings, each measuring <math>1\frac{3}{4}</math> meters high by <math>\frac{4}{5}</math> meter wide, are hung in the display space. What is the total area of the three paintings? How much of the display area is still available?</p>



# Lesson 4 Problem-Solving Practice

## Dividing Rational Numbers

<p>1. In the 16th century, Spain had a silver coin called a peso. The coin was divided into 8 reals. Reals were stamped with an 8, and became known as pieces of eight. How many pesos would have been equivalent to 26 pieces of eight?</p>	<p>2. An anna is an Indian coin equivalent to one sixteenth of a rupee. How many rupees equal 45 annas?</p>
<p>3. The width of a rectangle can be found by dividing its area by its length. The area of the rectangle below is <math>30\frac{1}{2}</math> square feet.</p> <div style="text-align: center;"><p>A rectangle is shown with a horizontal dimension line below it. The dimension line has arrows at both ends pointing to the bottom corners of the rectangle and is labeled "10 ft".</p></div> <p>What is the width of the rectangle?</p>	<p>4. In order to vote on any decision, a club requires the presence of <math>\frac{3}{16}</math> of all club members. To be approved, a proposal needs <math>\frac{2}{3}</math> of the votes cast. A club has a membership of 224. What is the minimum number of votes needed for a proposal to be approved?</p>
<p>5. Rachel has a tub that holds <math>10\frac{1}{2}</math> gallons of water. The smaller container she is using to fill the tub holds <math>1\frac{3}{4}</math> gallons of water. How many times will she need to empty the smaller container into the tub until the tub is full?</p>	<p>6. Refer to the information in Exercise 5. Each stack of tiles is <math>17\frac{1}{2}</math> inches tall. If each tile is <math>1\frac{1}{4}</math> inches thick, how many tiles are in a stack?</p>

# Lesson 5 Problem-Solving Practice

## Adding and Subtracting Like Fractions

1. A  $3\frac{3}{8}$ -ounce scoop of strawberry ice cream was stacked on top of a  $2\frac{7}{8}$ -ounce scoop of chocolate ice cream. What is the total weight of ice cream on the cone?

2. The following table shows the amount of civil twilight (length of time you can see without artificial illumination) for Seattle, Washington, for several dates throughout the year.

Date	Civil Twilight (h)
March 20	$13\frac{13}{20}$
June 21	$17\frac{11}{20}$
September 22	$13\frac{13}{20}$
December 21	$9\frac{19}{20}$

For how much more time can a person in Seattle see without artificial illumination on June 21st than on December 21st?

3. A picket fence has slats that are  $\frac{5}{12}$  foot wide separated by gaps that are  $\frac{7}{12}$  foot wide. How long is a fence with 30 slats?

4. When Danny, who is  $57\frac{7}{8}$  inches tall, stands on a ledge  $9\frac{5}{8}$  inches off the ground, he remains hidden behind a wall  $70\frac{3}{8}$  inches tall.

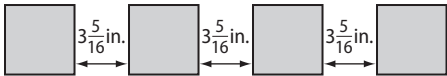
What is the distance between the top of Danny's head and the top of the wall?

5. Jean and Fred are making apple crisp. The recipe calls for 8 apples to be peeled and cut into pieces. However, as Fred and Jean work, they eat pieces of apple. Fred eats  $\frac{2}{9}$  of each apple he peels, and Jean eats  $\frac{1}{9}$  of each apple she peels. Assuming they each peel and cut four apples, how many apples will they have left over for the recipe after they peel eight apples?

6. Refer to the information in Exercise 5. If Jean peels and cuts two more apples, will they have enough for the recipe? If so, how much extra is there? If not, how much more do they need?

# Lesson 6 Problem-Solving Practice

## Adding and Subtracting Unlike Fractions

<p>1. A jug contains <math>3\frac{1}{6}</math> pints of milk. Ashley's family poured out <math>1\frac{2}{3}</math> pints of milk during breakfast. How much milk remains in the jug?</p>	<p>2. Jane is building a basic stand using wooden blocks. A wooden block that is <math>\frac{5}{8}</math> inch thick is glued to a wooden block that is <math>\frac{3}{4}</math> inch thick. What is the combined thickness of the two blocks of wood?</p>
<p>3. A designer places four identical tiles on a surface and spaces them <math>3\frac{5}{16}</math> inches apart. Each tile is <math>7\frac{1}{4}</math> inches wide.</p>  <p>What is the length from the outside edge of the first tile to the outside edge of the last tile?</p>	<p>4. Ron wants to run 6 miles this week. He ran <math>1\frac{2}{3}</math> miles on Monday, <math>1\frac{2}{5}</math> miles on Tuesday, and <math>1\frac{3}{4}</math> miles on Wednesday. How many more miles does he need to run to reach his goal for the week?</p>
<p>5. Sandy worked extremely hard at her job and earned a large bonus at the end of the year. She decided to give her children <math>\frac{2}{5}</math> of her bonus and her grandchildren <math>\frac{1}{4}</math> of her bonus. How much of her bonus is Sandy keeping for herself?</p>	<p>6. Refer to the information in Exercise 5. Sandy decides to donate <math>\frac{1}{8}</math> of her bonus to a charity. How much will she be keeping for herself?</p>