Write each fraction as a decimal. Use bar notation if necessary.
(Examples 1–3)

1. \( \frac{7}{15} = \)

2. \( \frac{8}{18} = \)

3. \( \frac{-8}{12} = \)

4. \( -\frac{6}{7} = -0.857142 \)

5. \( \frac{3\frac{15}{44}}{44} = \)

6. \( -2\frac{5}{22} = \)

7. Sarafina had 34 out of 99 hits when she was at bat during the softball season. What was her batting average? (Example 4)

8. Shiv and his friends ate \( 3\frac{1}{6} \) pizzas. Write this amount as a decimal. (Example 4)

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

9. \(-0.9 = \)

10. \(-0.85 = \)

11. \(-3.8 = \)

Evaluate each expression.

12. \(|-2.3| = \)

13. \(\left|\frac{4}{13}\right| = \)

14. \(\left|\frac{-8}{7}\right| = \)

**STEM** There are over 2,700 species of snakes in the world. Over 600 species are venomous. Write the fraction of species that are not venomous as a decimal.

**Justify Conclusions** The ratio of the circumference of a circle to its diameter is represented by the number \( \pi \). The number \( \pi \) is a decimal that does not repeat. The fraction \( \frac{22}{7} \) is sometimes used as an estimate of \( \pi \). Is \( \frac{22}{7} \) a repeating decimal? Explain.

Lesson 4 Terminating and Repeating Decimals 263
17. **Reason Abstractly** Refer to the graphic novel frame below for Exercises a–b.

![Your Photos]

Our online album shows us the pictures we've taken so far.

<table>
<thead>
<tr>
<th>ALBUM 1</th>
<th>Photos</th>
</tr>
</thead>
<tbody>
<tr>
<td>During School</td>
<td>19</td>
</tr>
<tr>
<td>ALBUM 2</td>
<td>Photos</td>
</tr>
<tr>
<td>After School</td>
<td>24</td>
</tr>
</tbody>
</table>

a. How many total photos were taken? __________

b. What fraction of the photos were taken after school? Write this fraction as a decimal. Round to the nearest thousandth. __________

---

**H.O.T. Problems** Higher Order Thinking

18. **Identify Structure** Write a fraction and an equivalent terminating decimal between 0.2 and 0.6. __________

19. **Persevere with Problems** Predict whether or not the decimal equivalent to $\frac{17}{36}$ is terminating. Explain your reasoning. Check your prediction with a calculator. __________

20. **Which One Doesn't Belong?** Identify the decimal equivalent that does not have the same characteristic as the other three. Explain.

\[
\begin{align*}
\frac{1}{12} & \quad 0.\overline{83} \\
\frac{2}{12} & \quad 0.1\overline{6} \\
\frac{3}{12} & \quad 0.25 \\
\frac{4}{12} & \quad 0.\overline{3}
\end{align*}
\]

0.25 is a terminating decimal. All the others are repeating decimals.

---

**Standardized Test Practice**

21. Which decimal represents the shaded portion of the figure below?

- A 0.4
- C 0.5
- B 0.\overline{4}
- D 0.5

264 Chapter 3 Integers and the Coordinate Plane
Write each fraction as a decimal. Use bar notation if necessary.

22. \( \frac{32}{75} = 0.42\overline{6} \)

23. \( \frac{3}{11} = \) ____________

24. \( -\frac{5}{8} = \) ____________

25. \( -\frac{7}{10} = \) ____________

26. \( 2\frac{5}{7} = \) ____________

27. \( -1\frac{80}{99} = \) ____________

28. Cris answered 61 out of 66 questions correctly on a test. What is his test average to the nearest thousandth? ____________

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

29. \( -0.15 = \) ____________

30. \( -7.75 = \) ____________

31. \( -12.54 = \) ____________

32. Identify Repeated Reasoning The table shows the decimal equivalent to fractions with a denominator of 7.

<table>
<thead>
<tr>
<th>Fraction</th>
<th>Decimal</th>
<th>Fraction</th>
<th>Decimal</th>
</tr>
</thead>
<tbody>
<tr>
<td>( \frac{1}{7} )</td>
<td>0.142857</td>
<td>( \frac{4}{7} )</td>
<td>0.571428</td>
</tr>
<tr>
<td>( \frac{2}{7} )</td>
<td>0.285714</td>
<td>( \frac{5}{7} )</td>
<td>0.714285</td>
</tr>
<tr>
<td>( \frac{3}{7} )</td>
<td>0.428571</td>
<td>( \frac{6}{7} )</td>
<td>0.857142</td>
</tr>
</tbody>
</table>

a. What do you notice about the pattern of the six repeated numbers?

b. Using the decimals, add the first half of each pattern to the numbers in the last half. For example, \( \frac{1}{7} = 0.142857 \), so add 142 + 857.

What pattern do you notice?

c. Using a calculator, try the same experiment with \( \frac{5}{13} \). Is the result the same? Justify your reasoning.
33. Which decimal represents the shaded portion of the figure below?

\[ \text{A} \ 0.16 \quad \text{C} \ 0.17 \]
\[ \text{B} \ 0.16 \quad \text{D} \ 1.6 \]

34. Which of the following is not equivalent to 0.3?

F \ \frac{1}{3} \quad \text{G} \ \frac{3}{9} \quad \text{H} \ \frac{3}{10} \quad \text{I} \ \frac{11}{33}

35. Short Response Write \(-1.25\) as a fraction.

36. Fill in each \(\square\) with < or > to make a true statement. 4.NBT.2

36. 4,556 \(\square\) 4,565
37. 8,698 \(\square\) 8,689
38. 47,872 \(\square\) 47,871

39. 26,525 \(\square\) 26,522
40. 1,123,004 \(\square\) 1,123,040
41. 5,776,050 \(\square\) 5,775,005

42. The table shows the number of miles Katie walked for two weeks. Compare the distances using the < symbol. 5.NBT.3

<table>
<thead>
<tr>
<th>Week</th>
<th>Number of Miles</th>
</tr>
</thead>
<tbody>
<tr>
<td>1</td>
<td>5.78</td>
</tr>
<tr>
<td>2</td>
<td>5.691</td>
</tr>
</tbody>
</table>

43. The table shows the amount of different colored paints in a bin in art class. Compare the amount of blue and orange paint using the > symbol. 5.NBT.3

<table>
<thead>
<tr>
<th>Color</th>
<th>Number of Ounces</th>
</tr>
</thead>
<tbody>
<tr>
<td>Blue</td>
<td>47.362</td>
</tr>
<tr>
<td>Green</td>
<td>47.637</td>
</tr>
<tr>
<td>Orange</td>
<td>47.394</td>
</tr>
<tr>
<td>Yellow</td>
<td>47.583</td>
</tr>
</tbody>
</table>
What You'll Learn
Scan the lesson. List two headings you would use to make an outline of the lesson.

- **Rational Number**: Any number that can be written as a fraction; 
  - Denominator ≠ 0.

Real-World Link

**Insects** The lengths of several common types of insects are shown in the table.

1. Which of the insects is the longest?
   - **cricket**

2. Shade each fraction strip to represent the lengths of a fire ant and a housefly. Which is longer, the fire ant or housefly?
   - **fire ant**

<table>
<thead>
<tr>
<th>Insect</th>
<th>Length (In.)</th>
</tr>
</thead>
<tbody>
<tr>
<td>Green June</td>
<td>3/4</td>
</tr>
<tr>
<td>Beetle</td>
<td>1/4</td>
</tr>
<tr>
<td>Cricket</td>
<td>1/3</td>
</tr>
<tr>
<td>Fire ant</td>
<td>1/4</td>
</tr>
<tr>
<td>Firefly</td>
<td>1/4</td>
</tr>
<tr>
<td>Housefly</td>
<td>1/4</td>
</tr>
<tr>
<td>Japanese beetle</td>
<td>1/2</td>
</tr>
<tr>
<td>Mosquito</td>
<td>5/8</td>
</tr>
</tbody>
</table>

3. How many of the insects are longer than 0.5 inch?
   - 4 insects

4. Order the lengths of a housefly, a Green June beetle, and a fire ant from the shortest to longest.
   - Fire ant, Firefly, Housefly
Compare Decimals and Fractions

Positive and negative rational numbers can be represented on a number line. You can use a number line to help you compare and order rational numbers.

**Examples**

Fill in each \( \bigcirc \) with \(<\), \(>\), or \(=\) to make a true statement.

1. \(-1.2 \bigcirc 0.8\)

   Graph the decimals on a number line.

   Since \(-1.2\) is to the left of \(0.8\), \(-1.2 < 0.8\).

2. \(-1.40 \bigcirc -1.25\)

   Graph the decimals on a number line.

   Since \(-1.40\) is below \(-1.25\), \(-1.40 < -1.25\).

3. \(\frac{3}{8} \bigcirc \frac{5}{16}\)

   Rename the fractions using the least common denominator.

   \[
   \frac{3}{8} = \frac{3 \times 2}{8 \times 2} = \frac{6}{16}, \quad \frac{5}{16} = \frac{5 \times 1}{16 \times 1} = \frac{5}{16}
   \]

   Since \(-6 < -5\), \(-\frac{6}{16} < -\frac{5}{16}\) and \(-\frac{3}{8} < -\frac{5}{16}\).

**Got It?** Do these problems to find out.

a. \(3.1 \bigcirc -3.7\)

b. \(-4.5 \bigcirc -4.49\)

c. \(\frac{9}{16} \bigcirc \frac{12}{16}\)

d. \(-\frac{7}{10} \bigcirc -\frac{4}{5}\)
Compare and Order Rational Numbers

To compare and order rational numbers, first write them in the same form.

**Examples**

Fill in each circle with <, >, or = to make a true statement.

4. \(-0.51 \quad \underset{\text{\(\_\_\_\_\_\)}}{\text{\(\_\_\_\_\_\)}} \quad \frac{8}{15} \quad 0.5\overline{3}\)

Rename \(-\frac{8}{15}\) as a decimal. Then graph both decimals on a number line.

\[
-0.53 -0.51 \quad -0.6 \quad -0.55 \quad -0.5 \quad -0.45 \quad -0.4
\]

Since \(-0.51\) is to the right of \(-0.53\) on the number line, \(-0.51 > \frac{8}{15}\).

5. Order the set \(-2.46, -\frac{22}{25}, -\frac{1}{10}\) from least to greatest.

Write \(-\frac{22}{25}\) and \(-\frac{1}{10}\) as decimals to the hundredths place.

\[-\frac{22}{25} = -2.88 \quad -\frac{1}{10} = -2.1\]

From least to greatest, the order is \(-\frac{22}{25}, -2.46, -\frac{1}{10}\).

**Got It?** Do these problems to find out.

Fill in each circle with <, >, or = to make a true statement.

e. \(-3\frac{5}{8} \quad \underset{\text{\(\_\_\_\_\_\)}}{\text{\(\_\_\_\_\_\)}} \quad -3.625\)

f. \(\frac{3}{7} \quad \underset{\text{\(\_\_\_\_\_\)}}{\text{\(\_\_\_\_\_\)}} \quad 0.413\)

g. Order the set \(\{-7\frac{13}{20}, -7.78, -\frac{17}{100}\}\) from greatest to least.

\(-7.65, -7.78, -7.17\)

Lesson 5 Compare and Order Rational Numbers 269
Example

6. Mr. Plum's science class is growing plants under different conditions. The table shows the difference from the average for some students' plants. Order the differences from least to greatest.

Express each number as a decimal.

Ricky's plant: $3\frac{1}{4} = 3.25$
Debbie's plant: $-2.2$
Suni's plant: $1.7$
Leonora's plant: $-1\frac{7}{10} = -1.7$

From least to greatest, the differences are $-2.2$, $-1\frac{7}{10}$, $1.7$, and $3\frac{1}{4}$.

Guided Practice

Fill in each □ with $<$, $>$, or $=$ to make a true statement. (Examples 1–4)

1. $9.7 \quad > \quad -10.3$
2. $\frac{5}{8} \quad > \quad -\frac{3}{8}$
3. $-6.7 \quad < \quad -6\frac{7}{10}$
4. $\frac{5}{6} \quad > \quad -0.94$

Order the following sets of numbers from least to greatest. (Example 5)

5. $\left\{-3\frac{1}{3}, 3.3, -3\frac{3}{4}, 3.5\right\}$

6. $\left\{-3\frac{3}{4}, -3\frac{1}{3}, 3.3, 3.5\right\}$

7. **Financial Literacy** Steve recorded these amounts in his checkbook: $-6.50$, $7.00$, $-6.75$, and $7.25$. Order these amounts from least to greatest. (Example 6)

8. **Building on the Essential Question** How can a number line help in ordering rational numbers?