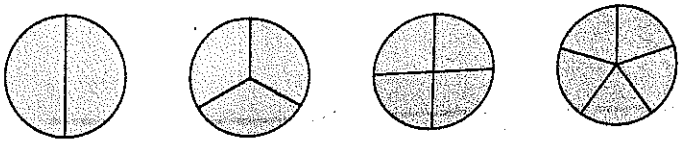
## • Subtracting a Fraction from 1

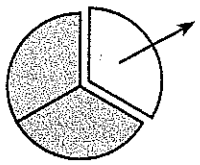
- If the numerator (top) and denominator (bottom) are the same, the fraction equals 1.



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

- When adding fractions and mixed numbers, remember to simplify any fraction names for 1 in the answer.
- To subtract a fraction from 1, rename the 1 as a fraction.

$$1 - \frac{1}{3}$$
$$\downarrow \quad \downarrow$$
$$\frac{3}{3} - \frac{1}{3} = \frac{2}{3}$$



- Look at the fraction that is being subtracted to decide which name for 1 to use.

---

***Practice:***

**1.** Write a fraction equal to 1 that has a denominator of 5. _____

Compare.

**2.** $\frac{3}{3}$ ◯ 1

**3.** $3\frac{3}{3}$ ◯ 4

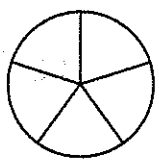
Add.

**4.** $\frac{4}{10} + \frac{6}{10} =$ _____

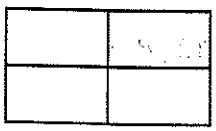
**5.** $\frac{3}{8} + \frac{5}{8} =$ _____

Subtract. (Rename the 1.)

**6.** $1 - \frac{1}{5} =$ _____



**7.** $1 - \frac{3}{4} =$ _____



**8.** How many fraction names for 1 are there? _____

**A** none **B** 15 **C** 340 **D** infinite



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## • Finding a Fraction to Complete a Whole

- To find a fraction to complete a whole, first rename the 1 with a matching numerator and denominator before subtracting.

**Example:** Two fifths of the students are girls.

What fraction of the students are boys?

**Solution:** This picture shows that the students are $\frac{5}{5}$.

The girls are $\frac{2}{5}$ of the students.

$\frac{5}{5} - \frac{2}{5} = \frac{3}{5}$, so the boys must be $\frac{3}{5}$ of the students.

***Practice:***

1. Maggie completed three sevenths of her homework assignment. What fraction of her assignment is left to complete?

_____

2. Four tenths of the skateboarders were able to use a half-pipe without falling. What fraction of the skateboarders were unable to use a half-pipe?

_____

3. Two eighths of the championship football game tickets sold for under $30. One eighth of the tickets sold for more than $100. What fraction of the tickets sold for an amount between $30 and $100?

_____

4. Yancey ran a mile faster than seven ninths of his classmates. If Yancey ran a mile in 7 minutes 30 seconds, what fraction of his classmates ran the mile in 7 minutes 30 seconds or less?

_____

5. Marlena is learning how to take photographs. She has taken eleven twelfths of the pictures on the roll of film. What fraction of the pictures on the roll of film does she have left to take?

_____



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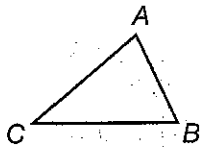
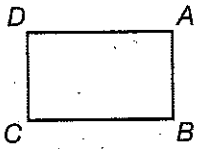
## • Using Letters to Identify Geometric Figures

- To name a **polygon**, use the letters at its vertices.
  1. Choose any vertex as the starting point.
  2. Move around the perimeter in either direction, recording the letter of each vertex in order. Be careful not to skip any vertices.
  3. Stop after all vertices have been recorded.

**Examples:**




This triangle is $\triangle ABC$. It can also be named $\triangle BCA$, $\triangle CAB$, $\triangle ACB$, $\triangle BAC$, or $\triangle CBA$.



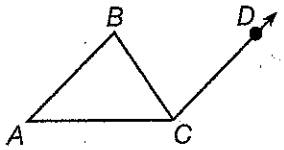

This is rectangle *ABCD* or *ADCB*, but not *ACBD* or *ACDB*.

- Name a **line** by naming two points on the line.
- Name a **segment** by naming the endpoints of the segment.
- Name a **ray** by first naming the endpoint and then a point on the ray.

**Naming Lines, Segments, and Rays**

| Figure | Name | Abbreviation |
|---|---|---|
| A B | line *AB* | $\overleftrightarrow{AB}$ |
| A B | segment *AB* | $\overline{AB}$ |
| A B | ray *AB* | $\overrightarrow{AB}$ |

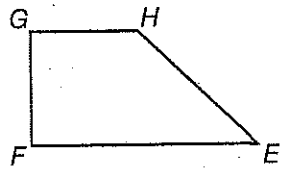
- Name an angle using the letter at its vertex. If there is a chance for confusion, use three letters with the vertex as the middle letter.




Angle *ACB* is inside the triangle. Angle *BCD* is outside the triangle. Each has *C* at its vertex.

***Practice:***

**1.** Name this trapezoid four different ways.




_____ _____ _____ _____

**2.** Which segment is perpendicular to $\overline{GH}$? _____

**3.** If $\overline{GH}$ is 14 cm long and if $\overline{FE}$ is twice the length of $\overline{GH}$, then what is $\overline{FE}$? _____

**4.** Rename angle *BAC* using only its vertex. _____

## • Estimating Arithmetic Answers with Rounded and Compatible Numbers

- Estimation uses rounded numbers to make the math easier.
- An estimated answer is not an exact answer.
- You can estimate to see if your exact answers make sense.

**Examples:** Compare two ways of estimating a money arithmetic problem to the exact answer.

| | | |
|---|---|---|
| \$7.00 ← | \$7.23 → | \$7.25 |
| \$5.00 ← | \$4.77 → | \$4.75 |
| + \$12.00 ← | + \$12.43 → | + \$12.50 |
| \$24.00 | \$24.43 | \$24.50 |

In the estimate on the right, we rounded using compatible numbers and got an answer that was closer to the exact calculation. Sometimes using numbers you know, such as multiples of common money amounts, can help make estimating easier and more accurate.

***Practice:***

Estimate each answer by rounding the numbers before doing the arithmetic.

**1.** $57 \rightarrow 60$, $\times 47 \rightarrow \times 50$

**2.** $33 \rightarrow 30$, $+56 \rightarrow +60$

**3.** $45 \rightarrow$, $\times 35 \rightarrow \times$ ____

**4.** $37 - 17$ ____

**5.** $92 \times 25$ ____

**6.** $496 - 214$ ____

**7.** $531 + 489$ ____

**8.** $\frac{124}{31}$ ⟌

**9.** $\frac{252}{46}$ ⟌



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## • Subtracting a Fraction from a Whole Number Greater than 1

- To subtract a fraction from a whole number greater than 1:
  1. Line the numbers up vertically.
  2. Borrow 1 from the whole number and rename the 1 as a fraction.
  3. Subtract.
- Use the same steps to subtract a mixed number from a whole number, but remember to subtract the whole numbers column after the fractions column.

**Examples:**

$2 - \frac{1}{4}$

$$\begin{array}{r} {\scriptstyle 1}\not{2}\ \frac{4}{4} \\ -\ \ \frac{1}{4} \\ \hline 1\ \frac{3}{4} \end{array}$$

$8 - 1\frac{2}{3}$

$$\begin{array}{r} 8\ \frac{3}{3} \\ -\ 1\ \frac{2}{3} \\ \hline 6\ \frac{1}{3} \end{array}$$

- When you subtract a fraction from a whole number greater than 1, your answer will always be a mixed number greater than 1.

---

***Practice:***

Subtract. Borrow from the whole number and rename.

**1.** $\begin{array}{r} 3 \\ -\ \frac{2}{3} \\ \hline \end{array}$

**2.** $\begin{array}{r} 4 \\ -\ \frac{4}{5} \\ \hline \end{array}$

**3.** $\begin{array}{r} 2 \\ -\ 1\frac{1}{2} \\ \hline \end{array}$

**4.** $\begin{array}{r} 6 \\ -\ 4\frac{2}{5} \\ \hline \end{array}$

**5.** $\begin{array}{r} 9 \\ -\ 6\frac{3}{4} \\ \hline \end{array}$

**6.** $\begin{array}{r} 7 \\ -\ 6\frac{7}{8} \\ \hline \end{array}$

**7.** $\begin{array}{r} 11 \\ -\ 8\frac{5}{6} \\ \hline \end{array}$

**8.** $\begin{array}{r} 10 \\ -\ 9\frac{9}{10} \\ \hline \end{array}$

**9.** $\begin{array}{r} 3 \\ -\ 2\frac{3}{7} \\ \hline \end{array}$



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## • Using Money to Model Decimal Numbers

- We can use money to understand decimal numbers because our coins, such as pennies and dimes, represent fractional parts of whole dollar amounts.

  **Example:**

  1 penny = $\frac{1}{100}$ dollar

  1 dime = $\frac{1}{10}$ dollar

- We can write these fractions as decimals.

  $\frac{1}{100}$ = 0.01 = one hundredth  $\frac{1}{100}$ dollar = \$0.01 = 1 cent

  $\frac{1}{10}$ = 0.1 = one tenth  $\frac{1}{10}$ dollar = \$0.1 = 10 cents

| | Whole Numbers | | | Decimals | |
|---|---|---|---|---|---|
| Place Name | hundreds | tens | ones | tenths | hundredths |
| Place Value | 100 | 10 | 1 | $\frac{1}{10}$ | $\frac{1}{100}$ |
| Place | ____ | ____ | ____ | ____ | ____ |
| Money Value of Place | \$100 bills | \$10 bills | \$1 bills | dimes | pennies |

### *Practice:*

Name the place of the 5 in each of these numbers.

**1.** \$23.50 _____  **2.** \$58.19 _____

**3.** \$75.92 _____  **4.** \$46.05 _____

**5.** What combination of dollars, dimes, and pennies makes \$4.68 using the fewest bills and coins possible?

_____ dollars _____ dimes _____ pennies

**6.** Is \$13.56 closer to \$13.50 or \$13.60?

Remember to write the dollar sign. _____

**7.** Is \$7.14 closer to \$7.10 or \$7.20?

Remember to write the dollar sign. _____

Write each money amount as a decimal number, using a dollar sign.

**8.** twenty-three cents _____  **9.** nineteen cents _____

**10.** four cents _____  **11.** one hundred one cents _____

**12.** eight cents _____



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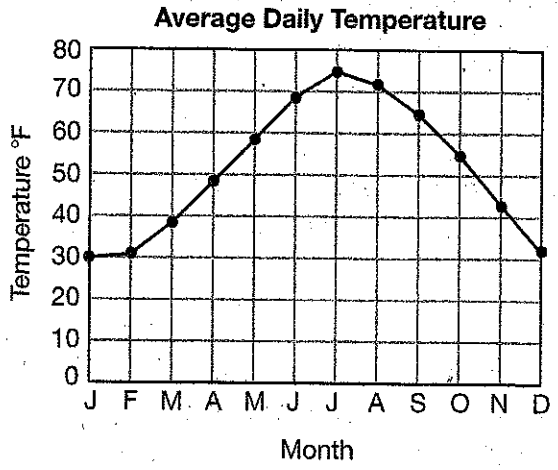
## • Line Graphs

- We can use **line graphs** to show changes in data over a period of time.
- In a line graph, data points are connected to show that a **trend** exists between the data points. We can read the line graph to predict or estimate values between plotted data points.
- We plot a line graph on a **coordinate grid**, with a **horizontal axis** (*x*-axis) and **vertical axis** (*y*-axis).
- Often, we use the horizontal axis for time, and the vertical axis for data values. Remember to label both axes when you draw your own line graphs.

---

***Practice:***

Use the line graph below to answer the following questions.




1. In which month was the average daily temperature about 50°F? _____
2. In which month was the average daily temperature about 15°F warmer than it was in March? _____
3. During how many months was the average daily temperature colder than 50°F? _____
4. Estimate the average temperature on September 15. _____
5. For how many months did the average daily temperature increase? _____
6. From January to July, in which month did the average daily temperature increase the least? _____
7. What is the range of the average temperatures show in the line graph? _____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## • Writing Tenths and Hundredths as Decimal Numbers

- The fraction $\frac{1}{10}$ and the decimal number 0.1 both name "one tenth".
- The fraction $\frac{1}{100}$ and the decimal number 0.01 both name "one hundredth".

**Examples:**

$\frac{60}{100} = 0.60$ $\frac{6}{10} = 0.6$

$\frac{6}{100} = 0.06$ $\frac{85}{100} = 0.85$

- Notice that when the fraction has only one digit in the numerator and the denominator is 100, we still write two digits after the decimal point.

---

***Practice:***

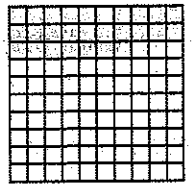
**1.** Name the shaded part of the rectangle as a fraction and as a decimal number.

Fraction: _____ Decimal: _____

**2.** Name the part of the rectangle that is not shaded both as a fraction and as a decimal number.

Fraction: _____ Decimal: _____

**3.** Name the shaded portion of the square both as a fraction and as a decimal number.



Fraction: _____ Decimal: _____

**4.** Name the unshaded portion of the square both as a fraction and as a decimal number.

Fraction: _____ Decimal: _____

Write a faction or mixed number as a decimal number.

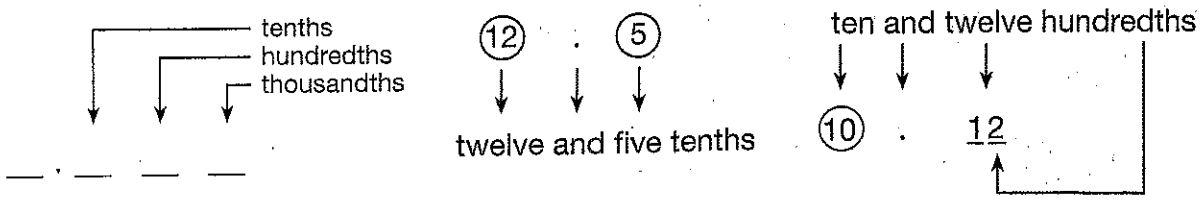
**5.** $1\frac{9}{10} =$ _____ **6.** $\frac{3}{100} =$ _____ **7.** $5\frac{67}{100} =$ _____

Write each decimal number as a fraction or mixed number.

**8.** 0.09 = _____ **9.** 3.6 = _____ **10.** 4.21 = _____

## • Naming Decimal Numbers

• When naming decimal numbers, name the place value of the last digit.




***Practice:***

Use words to name each decimal number.

1. 4.7 _____
2. 17.83 _____
3. 0.529 _____
4. 6.005 _____

Use digits to write each decimal number.

5. thirty-six and forty-eight hundredths ____ ____. ____ ____
6. nineteen and twenty-four hundredths ____ ____. ____ ____
7. seventy-one and five tenths ____ ____. ____
8. five hundred sixty-nine thousandths ____. ____ ____ ____



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## • Comparing and Ordering Decimal Numbers

- Fractions of a second are usually expressed as decimals.

  **Example:** Cameron ran the 400-meter dash in 63.5 seconds.

- To compare decimal numbers, look at the **place value**.

  $\underline{11}.7 > \underline{1}.7$ $\underline{2}.3 < \underline{23}.8$

  1. Compare whole numbers.
  2. Compare tenths.
  3. Compare hundredths.

- It helps to line up the numbers vertically along the decimal points.

  2.03
  2.3
  2.13

---

***Practice:***

**1.** Hilde rode her bicycle 200 meters in $\underline{22}.7$ seconds. Martin rode his bicycle 200 meters in $\underline{23}.4$ seconds. Which athlete rode faster? ("Faster" means fewer seconds.)

_____ rode faster

**2.** Compare. $\underline{4}.17 \bigcirc \underline{41}.7$

4.17
41.7

**3.** Write these numbers in order from least to greatest.

5.10 51.01 5.01 51.10

_____, _____, _____, _____

**4.** Write these numbers in order from greatest to least.

11.11 1.01 10.10 1.111

_____, _____, _____, _____

## • Writing Equivalent Decimal Numbers

- **Decimal places** are the number of digits to the right of the decimal point.

  1.234 → three decimal places
  15.2 → one decimal place

- Attaching zeros to the right of a decimal number does not change the value of the number.

  0.3 = 0.3000
  2.1 = 2.100000

- Money is usually written with two decimal places.

  $4.25 → two decimal places

- There are two ways to write money amounts.

  As a number of **cents** → 25¢
  As a decimal number of **dollars** → $0.25

- If a math problem uses two forms, rewrite it using the same form.

**Example:** To solve $2.14 + 67¢, both amounts must be in the same form.

$$\begin{array}{r} \$2.14 \\ +\ \$0.67 \\ \hline \$2.81 \end{array} \quad \text{or} \quad \begin{array}{r} 214¢ \\ +\ 67¢ \\ \hline 281¢ \end{array}$$

***Practice:***

Write each number with three decimal places.

**1.** 1.8 _____.___ ___ ___

**2.** 3.68 _____.___ ___ ___

**3.** 0.67000 _____.___ ___ ___

Compare.

**4.** 30 ◯ 300

**5.** 0.30 ◯ 0.03

**6.** 0.03 ◯ 0.030

Write each money amount both in cent form and in dollar form.

**7.** twenty cents

_____ ¢ $ _____

**8.** fifty-six cents

_____ ¢ $ _____

**9.** ninety-two cents

_____ ¢ $ _____



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