

SCALE CITY

KET

## The Road to Proportional Reasoning: Louisville Slugger Handouts

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# LOUISVILLE SLUGGER: HANDOUT 1

## Batting Practice

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

Date: \_\_\_\_\_

**Example Problem:** Sunny had 11 hits out of 34 times at bat. What was Sunny's batting average?  
 $11/34 = 0.32352941$ , so Sunny's batting average was .324.

1. Calculate the batting averages of the following players.

Player A 15 hits out of 70 times at bat       $15/70$       \_\_\_\_\_

Player B 10 hits out of 32 times at bat      \_\_\_\_\_      \_\_\_\_\_

Player C 20 hits out of 80 times at bat      \_\_\_\_\_      \_\_\_\_\_

Player D 12 hits out of 48 times at bat      \_\_\_\_\_      \_\_\_\_\_

2. Which two players have the same batting average? Use equivalent fractions to show that these averages are the same. How many hits out of 60 would result in the same average?

3. Which player has the best batting average?

4. Assuming that the batting average predicts future performance, how many hits might you expect that each player would make if the player batted 200 times? (Hint: Multiply the player's batting average by the number of scheduled times at bat.)

A. Player A \_\_\_\_\_

B. Player B \_\_\_\_\_

C. Player C \_\_\_\_\_

D. Player D \_\_\_\_\_

5. Babe Ruth and Ty Cobb are both on your fantasy baseball league team. Compare their stats.

A. How many hits would Babe Ruth be likely to have with a batting average of .342 and 200 times at bat?

B. How many hits would Ty Cobb be likely to have with a batting average of .366 and 200 times at bat?

C. What is the difference between Babe Ruth's number of hits and Ty Cobb's?

# KEY: LOUISVILLE SLUGGER: HANDOUT 1

## Batting Practice

**Example Problem:** Sunny had 11 hits out of 34 times at bat. What was Sunny's batting average?  
 $11/34 = 0.32352941$ , so Sunny's batting average was .324.

1. Calculate the batting averages of the following players.

Player A	15 hits out of 70 times at bat	$15/70$	.214
Player B	10 hits out of 32 times at bat	$10/32$	.313
Player C	20 hits out of 80 times at bat	$20/80$	.250
Player D	12 hits out of 48 times at bat	$12/48$	.250

2. Which two players have the same batting average? Use equivalent fractions to show that these averages are the same. How many hits out of 60 would result in the same average?

*Player C and Player D have the same average.  $12/48 = 20/80 = 1/4$ . 15 hits out of 60 would result in the same batting average because  $15/60$  also equals  $1/4$ .*

3. Which player has the best batting average?

*Player B*

*(As a follow-up for this question, ask students, "Without calculating, determine which of the following is the better batting average: 23 hits out of 60 at bats or 23 hits out of 50? 18 hits out of 26 at bats or 15 hits out of 26?" Then ask them to explain how they know which is better.)*

4. Assuming that the batting average predicts future performance, how many hits might you expect that each player would make if the player batted 200 times? (Hint: Multiply the player's batting average by the number of scheduled times at bat.)

A. Player A:  $200 \times .214 = 42.8$  hits

B. Player B:  $200 \times .313 = 62.5$  hits

C. Player C:  $200 \times .250 = 50$  hits

D. Player D:  $200 \times .250 = 50$  hits

*(As a possible follow-up, divide students into pairs to discuss alternative ways of solving these problems and then share the alternatives with the class. For example, they might suggest using equivalent fractions:  $15/70 = x/200$ . Or they might suggest cross multiplication. Both these methods emphasize the proportional reasoning that underlies the calculations in problem 4.)*

5. Babe Ruth and Ty Cobb are both on your fantasy baseball league team. Compare their stats.

A. How many hits would Babe Ruth be likely to have with a batting average of .342 and 200 times at bat?  
68.4 hits

B. How many hits would Ty Cobb be likely to have with a batting average of .366 and 200 times at bat?  
73.2 hits

C. What is the difference between Babe Ruth's number of hits and Ty Cobb's?  
4.8 hits. Students might round their answer to 5 hits, since 4.8 doesn't make sense in this context.

# LOUISVILLE SLUGGER: HANDOUT 2

## Sizing Up the Team

**Name:**

**Date:**

Teacher Model

**1.** The giant Louisville Slugger Bat in Louisville, Kentucky is 120 feet tall, making it the world's largest bat. It's a replica of the 34-inch bat that Babe Ruth once used. Babe Ruth was 6 feet 2 inches. Determine how large a statue of the Babe would be in feet in order to match the bat's size. Round your final answers to the nearest whole numbers.

Take the problem step by step.

**Step 1:** Determine the ratios using words. Write what the equivalent ratios would be. (Hint: Write equivalent fractions with words.)

**Step 2:** Convert the numbers to the same unit of measurement.

How many inches are in 120 feet? (Hint: Multiply 120 by the number of inches in a foot.) How many inches are in 6 feet 2 inches? (Hint: Multiply 6 by the number of inches in a foot.)

**Step 3:** Put the numbers into the ratio formulas. Write the equivalent ratios or proportion using numbers. Use "x" for the unknown number. (Hint: Match your numbers to the words from Step 1.)

**Step 4:** Solve for  $x$  by cross multiplying the equivalent ratios and dividing or by using some other method.

**Step 5:** Convert the answer to the unit of measurement asked for in the problem. Round your answers to the nearest whole numbers. How tall in inches would a statue of Babe Ruth need to be to match the bat? How tall in feet and inches would the statue need to be? (Hint: Divide the total inches by the number of inches in a foot.)

## Sizing Up the Team

### Guided Practice

**2.** A Babe Ruth souvenir bat is 7.5 inches long. The actual bat Babe Ruth used was 34 inches tall. Babe Ruth was 6 foot 2 inches tall. Determine how tall a figure to match the souvenir bat should be in inches. Round your answer to the nearest whole number.

**Step 1:** Determine the ratios using words. Write what the equivalent ratios would be.

**Step 2:** Convert the numbers to the same unit of measurement. How many inches are in 6 foot 2 inches?

**Step 3:** Put the numbers into the ratio formulas. Write the equivalent ratios or proportion using numbers. Use “ $x$ ” for the unknown number.

**Step 4:** Solve for  $x$  by cross multiplying the equivalent ratios and dividing or by using some other method.

**Step 5:** Convert the answer to the unit of measurement asked for in the problem. How tall in inches would a figure to match the souvenir bat be? Round to the nearest whole number.

## Sizing Up the Team

### Individual Practice

**3.** A baseball measures around 9 inches in circumference. The Louisville Slugger bat in downtown Louisville is a 120-foot replica of a 34-inch bat. If you created a giant ball to match the scale of the giant bat, what should its circumference be in feet? Round your answers to the nearest whole number.

**Step 1:** Determine the ratios using words. Write what the equivalent ratios would be.

**Step 2:** Convert the numbers to the same unit of measurement. How many inches is 120 feet?

**Step 3:** Put the numbers into the ratio formulas. Write the equivalent ratios or proportion using numbers. Use “ $x$ ” for the unknown number.

**Step 4:** Solve for  $x$  by cross multiplying the equivalent ratios and dividing or by using some other method.

**Step 5:** Convert the answer to the unit of measurement asked for in the problem. Round your answers to the nearest whole numbers. What should the circumference of the large ball be in inches to match the scale of the bat? What should its circumference be in feet?

# KEY: LOUISVILLE SLUGGER: HANDOUT 2

## Sizing Up the Team

### Teacher Model

**1.** The giant Louisville Slugger Bat in Louisville, Kentucky is 120 feet tall, making it the world's largest bat. It's a replica of the 34-inch bat that Babe Ruth once used. Babe Ruth was 6 feet 2 inches. Determine how large a statue of the Babe would be in feet in order to match the bat's size. Round your final answers to the nearest whole numbers.

**Step 1:** Determine the ratios using words. Write what the equivalent ratios would be.  
*Ask students to come up with various ways of expressing the ratios (see possibilities below).*

*Babe Ruth's bat height/world's largest bat height = Babe Ruth's height/Statue's height or  
World's largest bat height/Babe Ruth's bat height = Statue's height/Babe Ruth's height or  
Babe Ruth's bat height/Babe Ruth's height = World's largest bat height/Statue's height or  
Babe Ruth's height/Babe Ruth's bat height = Statue's height/ World's largest bat height*

**Step 2:** Convert the numbers to the same unit of measurement.

How many inches are in 120 feet? *1440 inches*

How many inches are in 6 feet 2 inches? *74 inches*

**Step 3:** Put the numbers into the ratio formulas. Write the equivalent ratios or proportion using numbers. Use "x" for the unknown number.

*34 in/1440 in = 74 in/x in or*

*1440 in/34 in = x in/74 in or*

*34 in/74 in = 1440 in/x in or*

*74 in/34 in = x in/1440 in*

**Step 4:** Solve for  $x$  by cross multiplying the equivalent ratios and dividing or by using some other method.

*[See Special Note to Teacher in the Similar Shadows Lesson Plan. This would be a good opportunity to discuss various ways of solving for  $x$ .]*

*34/1440 = 74/x or 1440/34 = x/74 or 34/74 = 1440/x or 74/34 = x/1440*

*34x = 1440 × 74*

*34x = 106560*

*x = 3134.12 inches*

*You might model solving the problem by determining the value of the known ratio 1440:34 ( $1440 \div 34 = 42.3529412$ —and multiplying 74 by that, again, getting 3134.12 inches). Ask students the meaning of the number you get by dividing the length of the small bat into the length of the large bat. (Answer: how many times longer than the small bat the big bat is.) How does this information help you solve the problem? You might use some simple whole numbers (making replicas 10 or 100 times longer) to help students think conceptually about these problems.*

**Step 5:** Convert the answer to the unit of measurement asked for in the problem. Round your answers to the nearest whole numbers. How tall in inches would a statue of Babe Ruth need to be to match the bat? *3134 inches* How tall in feet and inches would the statue need to be? (Hint: Divide the total inches by the number of inches in a foot.) *261 feet*

## KEY: Sizing Up the Team Guided Practice

**2.** A Babe Ruth souvenir bat is 7.5 inches long. The actual bat Babe Ruth used was 34 inches tall. Babe Ruth was 6 foot 2 inches tall. Determine how tall a figure to match the souvenir bat should be in inches. Round your answer to the nearest whole number.

**Step 1:** Determine the ratios using words. Write what the equivalent ratios would be.

*Souvenir bat length/Babe Ruth's bat length = figure height/ Babe Ruth's height or  
Babe Ruth's bat height/souvenir bat height = Babe Ruth's height/ figure height or  
Souvenir bat length /figure height = Babe Ruth's bat length/ Babe's Ruth's height or  
Figure height/ souvenir bat length = Babe Ruth's height/ Babe Ruth's bat length*

**Step 2:** Convert the numbers to the same unit of measurement. How many inches are in 6 foot 2 inches?

*74 inches*

**Step 3:** Put the numbers into the ratio formulas. Write the equivalent ratios or proportion using numbers. Use “x” for the unknown number.

*7.5 in/34 in = x in/74 in or*

*34 in/7.5 in = 74 in/x in or*

*7.5 in/x in = 34 in/74 in or*

*x in/7.5 in = 74 in/34 in*

**Step 4:** Solve for  $x$  by cross multiplying the equivalent ratios and dividing or by using some other method.

*7.5/34 = x/74 or 7.5/x = 34/74 or 34/7.5 = 74/x or x/7.5 = 74/34*

*7.5 × 74 = 34x*

*555 = 34x*

*x = 16.32 inches*

*7.5 ÷ 34 = 0.220588 × 74 = 16.32 (solved using the value of the known ratio).*

**Step 5:** Convert the answer to the unit of measurement asked for in the problem. How tall in inches would a figure to match the souvenir bat be? *16.32 inches* Round to the nearest whole number. *16 inches*

## KEY: Sizing Up the Team Individual Practice

**3.** A baseball measures around 9 inches in circumference. The Louisville Slugger bat in downtown Louisville is a 120-foot replica of a 34-inch bat. If you created a giant ball to match the scale of the giant bat, what should its circumference be in feet? Round your answers to the nearest whole number.

**Step 1:** Determine the ratios using words. Write what the equivalent ratios would be.

*baseball circumference/bat length = supersize baseball circumference/supersize bat length or  
bat length/baseball circumference = supersize bat length/supersize baseball circumference or  
baseball circumference/supersize ball circumference = bat length/supersize bat length or  
supersize ball circumference/baseball circumference = supersize bat length/bat length*

**Step 2:** Convert the numbers to the same unit of measurement. How many inches is 120 feet? *1440 inches*

**Step 3:** Put the numbers into the ratio formulas. Write the equivalent ratios or proportion using numbers. Use “x” for the unknown number.

$$9 \text{ in}/34 \text{ in} = x \text{ in}/1440 \text{ in} \text{ or}$$

$$34 \text{ in}/9 \text{ in} = 1440 \text{ in}/x \text{ in} \text{ or}$$

$$9 \text{ in}/x \text{ in} = 34 \text{ in}/1440 \text{ in} \text{ or}$$

$$x \text{ in}/9 \text{ in} = 1440 \text{ in}/34 \text{ in}$$

**Step 4:** Solve for  $x$  by cross multiplying the equivalent ratios and dividing or by using some other method.

$$9/34 = x/1440 \text{ or } 34/9 = 1440/x \text{ or } 9/x = 34/1440 \text{ or } x/9 = 1440/34$$

$$34x = 9 \times 1440$$

$$34x = 12960$$

$$x = 381.1764 \text{ inches}$$

$$9 \div 34 = 0.2647058 \times 1440 = 381.1764 \text{ inches}$$

**Step 5:** Convert the answer to the unit of measurement asked for in the problem. Round your answers to the nearest whole numbers. What should the circumference of the large ball be in inches to match the scale of the bat? *381 inches*  
What should its circumference be in feet? *32 feet*

# LOUISVILLE SLUGGER: HANDOUT 3

## Do You Remember Triangles?

**Name:**

**Date:**

- 1.** If two triangles are congruent, then

  - All the corresponding angles and corresponding sides are congruent.
  - All the corresponding angles are congruent, but not the sides.
  - Only one angle from each triangle would have the same measurement.
  - Only one side from each triangle would have the same measurement.
- 2.** A right angle has

  - 45 degrees
  - 60 degrees
  - 30 degrees
  - 90 degrees
- 3.** If you add all the angles of a triangle, the sum is

  - 90 degrees
  - 145 degrees
  - 180 degrees
  - 360 degrees
- 4.** The measurements of a triangle's sides are 3, 4, and 5. Another triangle has sides that are twice as long. The sides would measure

  - 6, 7, and 8
  - 6, 8, and 10
  - 5, 6, and 7
  - 9, 12, and 15
- 5.** In a right triangle, one angle measured 30 degrees. The angles of the triangle are

  - 30, 30, 120
  - 30, 60, 60
  - 30, 60, 90
  - 30, 90, 90
- 6.** In a right triangle, the longest side is always

  - the side opposite the right angle.
  - the side to the right of the right angle.
  - the side to the left of the right angle.
  - impossible to determine.
- 7.** In a right triangle, one angle measured 45 degrees. Another angle measured

  - 30 degrees
  - 45 degrees
  - 60 degrees
  - 135 degrees



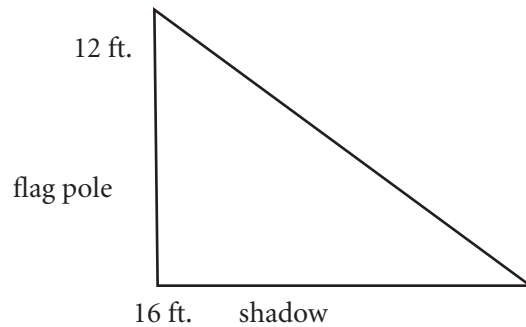
# KEY: LOUISVILLE SLUGGER: HANDOUT 3

## Do You Remember Triangles

1. A, 2. D, 3. C, 4. B, 5. C, 6. A, 7. B, 8. C, 9. B, 10. D

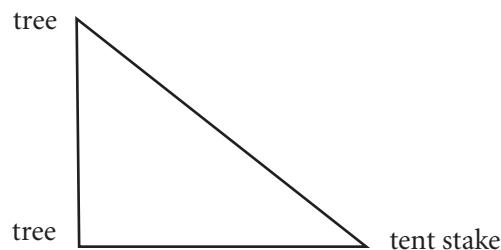
11. The shadow of the flagpole was 16 feet long. The flagpole was 12 feet tall. Draw a picture that shows how these everyday measurements can be represented as part of a right triangle. Label your drawing.

*The student's drawing should resemble a right triangle with the vertical leg representing the 12-foot flagpole and the horizontal leg representing its 16-foot shadow. The hypotenuse should extend from the top of the flagpole to the end of the shadow.*



12. Two trees stood on either side of the riverbank. The scouts set up a tent stake on the riverbank down from one of the trees. Draw a picture to show how the trees and the tent stake would make a triangle. Label your drawing.

*The student's drawing should depict a triangle (not necessarily a right triangle in this case) with the tent stake and the two trees labeled as the vertices.*



13-20. Multiply the following by 3.

4.5: 13.5

5.3: 15.9

23.5: 70.5

3.25: 9.75

2: 6

1.67: 5.01

35: 1.05

42.1: 126.3

# LOUISVILLE SLUGGER: HANDOUT 4

## Batter Up! Pay Attention

**Name:**

**Date:**

1. The Sultan of Swat and the Great Bambino are nicknames for
  - A. Ty Cobb
  - B. Pete Rose
  - C. Babe Ruth
  - D. Lou Gehrig
2. The Babe's cracked bat is on display in
  - A. Lexington, Kentucky
  - B. Owensboro, Kentucky
  - C. Cooperstown, New York
  - D. Louisville, Kentucky
3. The CNC machine at the Louisville Slugger factory can turn a bat in
  - A. 24 hours
  - B. 45 minutes
  - C. 45 seconds
  - D. 2 hours
4. The billets used to make bats are
  - A. 17 inches long
  - B. 33 inches long
  - C. 28 inches long
  - D. 37 inches long
5. The world's largest bat is
  - A. 120 feet tall
  - B. 50 feet tall
  - C. 30 feet tall
  - D. 1,020 feet tall
6. The hollow interior of the world's largest bat would hold
  - A. up to 300 gallons of water.
  - B. up to 30,000 gallons of water.
  - C. up to 300,000 gallons of water.
  - D. up to 3,000,000 gallons of water.

1 correct: Batter Box, 2 correct: Single, 3 or 4 correct: Double, 5 correct: Triple, 6 correct: Just like Babe Ruth. Home-run!

### Think About It: Question from "Greetings from the Louisville Slugger Museum"

"On a sunny day, that big bat casts a long shadow on the city sidewalk. Suppose you didn't know how tall the bat was. How could you use a normal size bat and a tape measure to determine its height?"

# KEY: LOUISVILLE SLUGGER: HANDOUT 4

## Batter Up! Pay Attention

1. C, 2. D, 3. C, 4. D, 5. A, 6. B

### Think About It: Question from “Greetings from the Louisville Slugger Museum”

“On a sunny day, that big bat casts a long shadow on the city sidewalk. Suppose you didn’t know how tall the bat was. How could you use a normal size bat and a tape measure to determine its height?”

*Allow students time to offer and discuss their theories about how to measure the world’s largest bat using shadows, a regular bat, and proportional reasoning.*



- 6.** The photograph from marching band practice showed the shadow from the 30-foot goal post reaching to the 10-yard line. The end zone is 10 yards deep. The shadow from the tuba player extends from the 10-yard line to the 15-yard line. What is the height of the tuba player from the top of his tuba to the ground?
- 7.** The math teacher took the class outside to practice using measurements with similar triangles. The shadow on the 12-inch ruler was 2.5 feet. Marco's shadow was 13.75 feet. How tall is Marco?
- 8.** The shadow of the baseball announcer box was 20 feet long. The catcher's shadow was 9 feet long. The announcer box is 11.5 feet tall. How tall is the catcher?
- 9.** The students measured the shadow of the street's tallest building to be 15 feet. The shadow of a student 5.5 feet tall was 24 inches. How tall is the building?
- 10.** Using a photograph from Google Earth, the shadow from the CN Tower in the Canadian city of Toronto measured 7.8 centimeters. The SkyDome's shadow measured 1.2 centimeters. The CN Tower stands 553.3 meters tall. How tall is the SkyDome?

# KEY: LOUISVILLE SLUGGER: HANDOUT 5

## Similar Shadows

### Teacher Tips:

Encourage students to discuss the methods they used to solve these problems and offer alternative approaches where appropriate.

1. The building's shadow was 14 feet long. The yardstick's shadow was 18 inches. How tall is the building? *28 feet*
2. The doll's shadow was 36 inches. The doll is 12 inches tall. Dory, the child who owns the doll, is 38 inches tall. How long will her shadow be? *114 inches*
3. Nikki is 58 inches tall. Her shadow was 23 inches long. At the same time, Ben's shadow was 26 inches long. How tall is Ben? *65.57 inches*
4. Khalid's shadow was 14 feet long. The shadow from the parking meter was 9 feet. The parking meter is 40 inches tall. How tall is Khalid? *5.185 feet*
5. Thales was a noted Greek mathematician and scholar who lived more than 2500 years ago. According to legend, he calculated the height of the Great Pyramid in Egypt using his own height, shadows, and right triangles. Use words to write two equivalent ratios (a proportion) that Thales could have used to solve the problem.  
*Thales' height/Thales' shadow length = Pyramid's height/Pyramid's shadow length or  
Thales' height/Pyramid's height = Thales' shadow length/Pyramid's shadow length or  
Thales' shadow length/Thales' height = Pyramid's shadow length/Pyramid's height or  
Pyramid's height/Thales' height = Pyramid's shadow length/Thales' shadow length*
6. The photograph from marching band practice showed the shadow from the 30-foot goal post reaching to the 10-yard line. The end zone is 10 yards deep. The shadow from the tuba player extends from the 10-yard line to the 15-yard line. What is the height of the tuba player from the top of his tuba to the ground? *7.5 feet*
7. The math teacher took the class outside to practice using measurements with similar triangles. The shadow of the 12-inch ruler was 2.5 feet. Marco's shadow was 13.75 feet. How tall is Marco? *5.5 feet*
8. The shadow of the baseball announcer box shadow was 20 feet long. The catcher's shadow was nine feet long. The announcer box is 11.5 feet tall. How tall is the catcher? *5.175 feet*
9. The students measured the shadow of the street's tallest building to be 15 feet. The shadow of a student 5.5 feet tall was 24 inches. How tall is the building? *41.25 feet*
10. Using a photograph from Google Earth, the shadow from the CN Tower in the Canadian city of Toronto measured 7.8 centimeters. The SkyDome's shadow measured 1.2 centimeters. The CN Tower stands 553.3 meters tall. How tall is the SkyDome? *85.12 meters*

### Note to Teacher:

*This is not the actual height of the SkyDome, but it is not far off. The SkyDome stadium stands 31 stories high. Since one story is about three meters, 31 stories would be about 93 meters. It was difficult to determine where the shadows of both structures began, which may account for the discrepancy.*

# LOUISVILLE SLUGGER: HANDOUT 6

## Similar Shapes

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

Date: \_\_\_\_\_

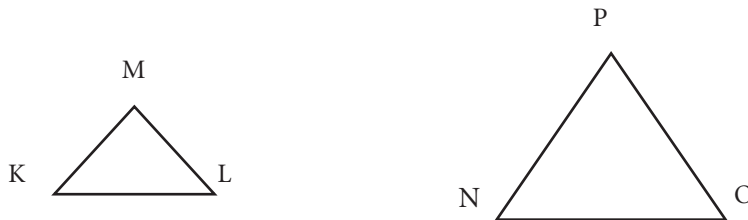
Answer the following questions. Where the solution requires decimals that do not come out evenly, answer to three places.

1. When you hear two triangles are similar, what is always true about the corresponding angles?

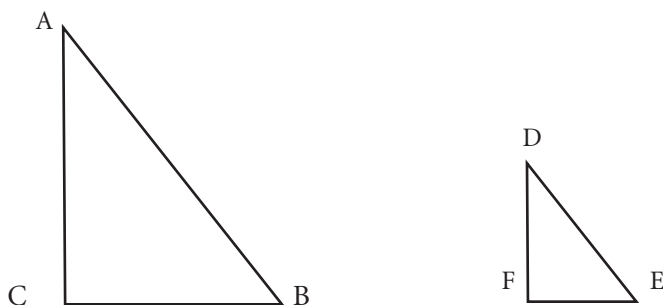
2.  $\triangle ABC$  is similar to  $\triangle EFG$ . What equivalent ratios or proportions are true of the triangle's sides? (Hint: The sides are AB, BC, and AC and EF, FG, and EG.)



3.  $\triangle KLM$  is similar to  $\triangle NOP$ . Side KL equals 3, side NO equals 6, and side LM equals 2. What is the length of side OP?

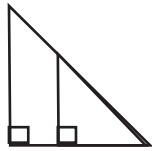


4.  $\triangle ABC$  is similar to  $\triangle DEF$ . Side AC equals 6, side DF equals 2, and side CB equals 3.6. What is the length of side EF?

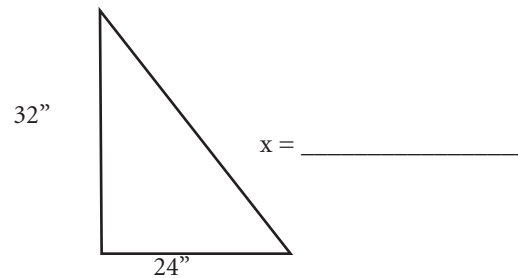
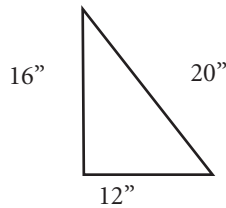


5. A triangle has dimensions of 4 cm, 5 cm, and 8 cm. The copy machine is set to copy at 125% of the image. What would the dimensions of the copied triangle be?

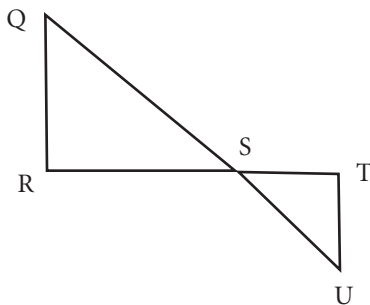
6. How do you know the two triangles below are similar?



7. A triangle has sides measuring 12, 16, and 20 inches. It is similar to a triangle with sides measuring 24 and 32 inches. How long is the remaining side?



8.  $\triangle QRS$  is similar to  $\triangle UTS$  (to visualize this better, imagine  $\triangle UTS$  flipped up beside  $\triangle QRS$ ). Side  $QR$  equals 10.4, side  $QS$  equals 14, and side  $UT$  equals 6.8. What is the length of side  $US$ ?



9. Why would it be difficult to use the Leaning Tower of Pisa's shadow to determine its height?

10. How could you use your height, measuring tape, similar triangles and shadows to estimate the height of a tree?

A. What formula using words would represent the equivalent ratios?

B. What would you need to measure?

# KEY: LOUISVILLE SLUGGER: HANDOUT 6

## Similar Shapes

Answer the following questions. Where the solution requires decimals that do not come out evenly, answer to three places.

**1.** When you hear two triangles are similar, what is always true about the corresponding angles?

*The corresponding angles of similar triangles are congruent.*

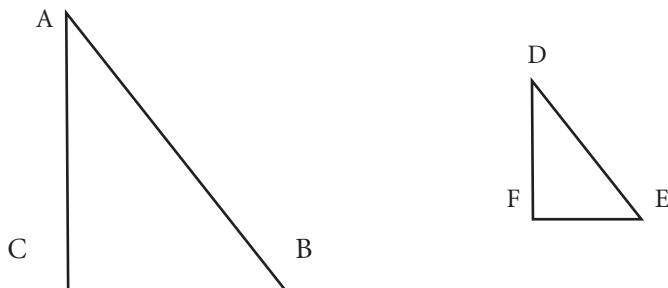
**2.**  $\triangle ABC$  is similar to  $\triangle EFG$ . What equivalent ratios or proportions are true of the triangle's sides? (Hint: The sides are AB, BC, and AC and EF, FG, and EG.) Side AB/Side EF = Side BC/Side FG = Side AC/Side EG



**3.**  $\triangle KLM$  is similar to  $\triangle NOP$ . Side KL equals 3, side NO equals 6, and side LM equals 2. What is the length of side OP? 4



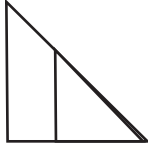
**4.**  $\triangle ABC$  is similar to  $\triangle DEF$ . Side AC equals 6, side DF equals 2, and side CB equals 3.6. What is the length of side EF? 1.2



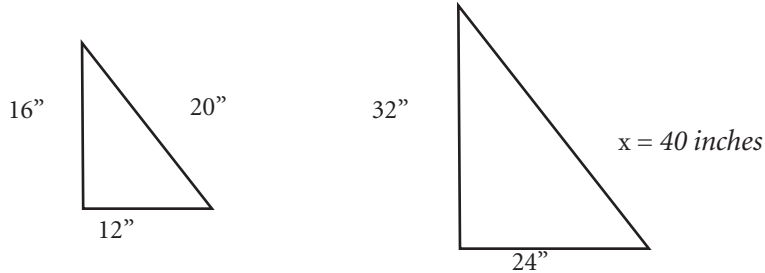
**5.** A triangle has dimensions of 4 cm, 5 cm, and 8 cm. The copy machine is set to copy at 125% of the image. What would the dimensions of the copied triangle be? 5 cm, 6.25 cm, and 10 cm

## KEY: Similar Shapes

**6.** How do you know the two triangles below are similar? *The triangles are similar because two corresponding angles are congruent, so all angles are congruent.*

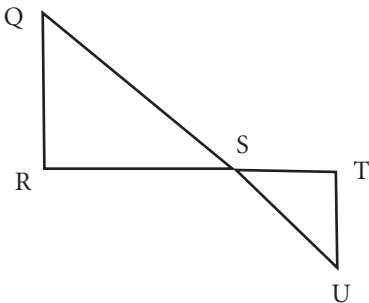


**7.** A triangle has sides measuring 12, 16, and 20 inches. It is similar to a triangle with sides measuring 24 and 32 inches. How long is the remaining side?



**8.**  $\triangle QRS$  is similar to  $\triangle UTS$  (to visualize this better, imagine  $\triangle UTS$  flipped up beside  $\triangle QRS$ ). Side QR equals 10.4, side QS equals 14, and side UT equals 6.8. What is the length of side US?

$$\begin{aligned} QR/QS &= UT/US \\ 10.4/6.8 &= 14/x \\ \text{Side } US &= 9.154 \end{aligned}$$



**9.** Why would it be difficult to use the Leaning Tower of Pisa's shadow to determine its height?  
*The tower is not positioned at a 90-degree angle, so it would be difficult to match the angle to create a similar triangle.*

**10.** How could you use your height, measuring tape, similar triangles and shadows to estimate the height of a tree?

A. What formula using words would represent the equivalent ratios?  
*Height of person/person's shadow length = height of tree (x)/tree's shadow length*

B. What would you need to measure?  
*My height, the length of my shadow, the length of the shadow of the tree*

# LOUISVILLE SLUGGER: HANDOUT 7

## Game Time Questions

**Name:**

**Date:**

Double

1. Calculate this batting average: 15 hits out of 70 times at bat.

Single

2. If you made a triangle using the corner of construction paper as one of the angles, you would know the corner angle measures \_\_\_\_\_.

Single

3. If you add all the angles of a triangle, the sum will always be \_\_\_\_\_.

Double

4. A triangle with sides 5 feet, 6 feet, and 10 feet is similar to a triangle with sides three times as long. How long would the sides be?

Double

5. Calculate this batting average: 10 hits out of 32 times at bat.

Triple

6. The world's largest bat is 120 feet tall. It is a replica of a bat that was 34 inches tall. What is the percent value of the ratio of the large bat's height to the regular bat's height?

## Game Time Questions

Homerun

**7.** If a housefly is 0.3 inches long, how long should a fly be to match the world's largest bat? The bat is 1440 inches tall and is a replica of the actual bat of 34 inches.

Single

**8.** Calculate this batting average: 20 hits out of 80 times at bat.

Homerun

**9.** The world's largest bat is 120 feet tall. It is a replica of a bat that was 34 inches tall. If a stick of gum is  $2\frac{7}{8}$  inches in real life, how big would a stick of gum be in inches to match the world's largest bat?

Triple

**10.** The shadow from the school flag pole was 16 feet long. Mia's shadow was three feet long. Mia is 5.625 feet tall. How tall is the flagpole?

Double

**11.** A triangle with sides measuring 30 cm, 18 cm, and 18 cm is similar to a triangle with sides that measure one third of its sides. What are the measurements of the smaller triangle?

Double

**12.** Calculate the batting average: 12 hits out of 48 times at bat.

## Game Time Questions

Double

**13.** Sato has a batting average of .315. If he continues to perform at the same average, how many hits will Sato have out of 45 times at bat? (Round to the nearest whole number.)

Homerun

**14.** An aerial photograph of the town showed the shadow of the church steeple to extend one block or six inches. The shadow of the stop sign was 0.3 inches. The actual stop sign is eight feet tall. How many feet tall is the steeple?

Homerun

**15.** June had a photograph of her great-grandfather standing by the mailbox. The shadow of the mailbox was two inches. Great-grandfather's shadow was 3.25 inches. The mailbox is 43 inches tall. How many feet tall was June's great grandfather?

Triple

**16.** On a sunny day, Cory stood in line to buy concert tickets. The back of the line was outside the shadow of the box office building, which was six meters in length. Cory's shadow was 3.3 meters. Cory is 1.65 meters tall. How tall is the building?

Double

**17.** Babe Ruth's batting average was .342. How many hits would you expect out of 125 times at bat? Round up to the nearest whole number

Triple or Homerun (Choose an option.)

**18.** The world's largest bat is 120 feet tall. It is a replica of a 34 inch bat. A popcorn box is 9.5 inches tall.

Triple Option

A. How tall in inches would a large popcorn box be that would go with the world's largest bat?

Homerun Option

B. How tall would the popcorn box be in feet?

# KEY: LOUISVILLE SLUGGER: HANDOUT 7

## Game Time Questions

Double

1. Calculate this batting average: 15 hits out of 70 times at bat. *.214*

Single

2. If you made a triangle using the corner of construction paper as one of the angles, you would know the corner angle measures *90 degrees*.

Single

3. If you add all the angles of a triangle, the sum will always be *180 degrees*.

Double

4. A triangle with sides 5 feet, 6 feet, and 10 feet is similar to a triangle with sides three times as long. How long would the sides be? *15 feet, 18 feet, and 30 feet*

Double

5. Calculate this batting average: 10 hits out of 32 times at bat. *.313*

Triple

6. The world's largest bat is 120 feet tall. It is a replica of a bat that was 34 inches tall. What is the percent value of the ratio of the large bat's height to the regular bat's height?  *$120 \times 12/34 = 1440/34 = 42.35 = 4235\%$*

Homerun

7. If a housefly is 0.3 inches long, how long should a fly be to match the world's largest bat? The bat is 1440 inches tall and is a replica of the actual bat of 34 inches.

$$0.3/34 = x/1440$$

*The fly would be 12.71 inches.*

Single

8. Calculate this batting average: 20 hits out of 80 times at bat. *.250*

Homerun

9. The world's largest bat is 120 feet tall. It is a replica of a bat that was 34 inches tall. If a stick of gum is  $2 \frac{7}{8}$  inches in real life, how big would a stick of gum be in inches to match the world's largest bat?

$$34/1440 = 2.875/x$$

*The gum would 121.76 inches long.*

Triple

10. The shadow from the school flag pole was 16 feet long. Mia's shadow was three feet long. Mia is 5.625 feet tall. How tall is the flagpole? *30 feet tall*

Double

11. A triangle with sides measuring 30 cm, 18 cm, and 18 cm is similar to a triangle with sides that measure one third of its sides. What are the measurements of the smaller triangle?

*10 cm, 6 cm, and 6 cm*

Double

**12.** Calculate the batting average: 12 hits out of 48 times at bat. *.250*

Double

**13.** Sato has a batting average of .315. If he continues to perform at the same average, how many hits will Sato have out of 45 times at bat? (Round to the nearest whole number.) *14 hits*

Homerun

**14.** An aerial photograph of the town showed the shadow of the church steeple to extend one block or six inches. The shadow of the stop sign was 0.3 inches. The actual stop sign is eight feet tall. How many feet tall is the steeple?  
*160 feet tall (1920 inches)*

Homerun

**15.** June had a photograph of her great-grandfather standing by the mailbox. The shadow of the mailbox was two inches. Great-grandfather's shadow was 3.25 inches. The mailbox is 43 inches tall. How many feet tall was June's great grandfather?  
*5.82 feet (69.88 inches)*

Triple

**16.** On a sunny day, Cory stood in line to buy concert tickets. The back of the line was outside the shadow of the box office building, which was six meters in length. Cory's shadow was 3.3 meters. Cory is 1.65 meters tall. How tall is the building?  
*3 meters*

Double

**17.** Babe Ruth's batting average was .342. How many hits would you expect out of 125 times at bat? Round up to the nearest whole number. *43 hits*

Triple or Homerun (Choose an option.)

**18.** The world's largest bat is 120 feet tall. It is a replica of a 34 inch bat. A popcorn box is 9.5 inches tall.

Triple Option

A. How tall in inches would a large popcorn box be that would go with the world's largest bat?  
*402.35 inches*

Homerun Option

B. How tall would the popcorn box be in feet?  
*33.53 feet*

# LOUISVILLE SLUGGER: HANDOUT 8

## Comparing Little League and Major League Baseball Fields

**Name:**

**Date:**

How do the dimensions of a Little League baseball field compare to the dimensions of a Major League field?

### Little League Dimensions

Distance between bases: 60 feet

Distance from pitcher's mound to home plate: 46 feet

### Major League Baseball Field Dimensions

Distance between bases: 90 feet

Distance from pitcher's mound to home plate: 60.5 feet

1. What is the ratio of a Little League baseline to a Major League baseline?
2. What fraction in simplest form compares a Little League baseline to a Major League baseline?
3. What is the ratio of the distance from the pitcher's mound to home plate in Little League to the distance from the pitcher's mound to home plate in Major League baseball?
4. Use the ratios to complete the following blanks. Hint: Convert the fractions to decimal numbers and then to percents.
  - A. The distance between Little League bases is \_\_\_\_\_ percent of the distance between bases in Major League baseball.
  - B. Pitchers in Little League throw the baseball \_\_\_\_\_ percent as far as pitchers in Major League baseball throw the ball.
5. Why do you think the ratio of Little League baselines to Major League baselines isn't the same as the ratio of the distances between their pitcher's mounds and home plates?

# KEY: LOUISVILLE SLUGGER: HANDOUT 8

## Comparing Little League and Major League Baseball Fields

How do the dimensions of a Little League baseball field compare to the dimensions of a Major League field?

### Little League Dimensions

Distance between bases: 60 feet

Distance from pitcher's mound to home plate: 46 feet

### Major League Baseball Field Dimensions

Distance between bases: 90 feet

Distance from pitcher's mound to home plate: 60.5 feet

**1.** What is the ratio of a Little League baseline to a Major League baseline?

*60 feet: 90 feet or 60 feet/90 feet*

**2.** What fraction in simplest form compares a Little League baseline to a Major League baseline?  $\frac{2}{3}$

**3.** What is the ratio of the distance from the pitcher's mound to home plate in Little League to the distance from the pitcher's mound to home plate in Major League baseball?

*46 feet: 60.5 feet or 46/60.5*

**4.** Use the ratios to complete the following blanks. Hint: Convert the fractions to decimal numbers and then to percents.

A. The distance between Little League bases is **67** percent of the distance between bases in Major League baseball.

B. Pitchers in Little League throw the baseball **76** percent as far as pitchers in Major League baseball throw the ball.

**5.** Why do you think the ratio of Little League baselines to Major League baselines isn't the same as the ratio of the distances between their pitcher's mounds and home plates?

*Students might speculate about such things as the safety of batters if the pitcher stands too close (necessitating more distance between the pitcher's mound and home plate in the Little League field) or the relative speed and endurance of Little League players vs. Major League players (baselines might need to be relatively shorter to accommodate the physical abilities of younger players).*