

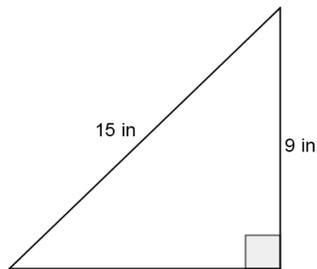
Name \_\_\_\_\_

Date \_\_\_\_\_

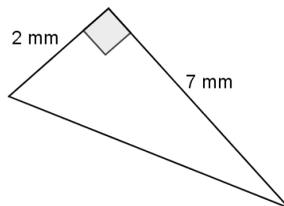
## Lesson 1: The Pythagorean Theorem

### Exit Ticket

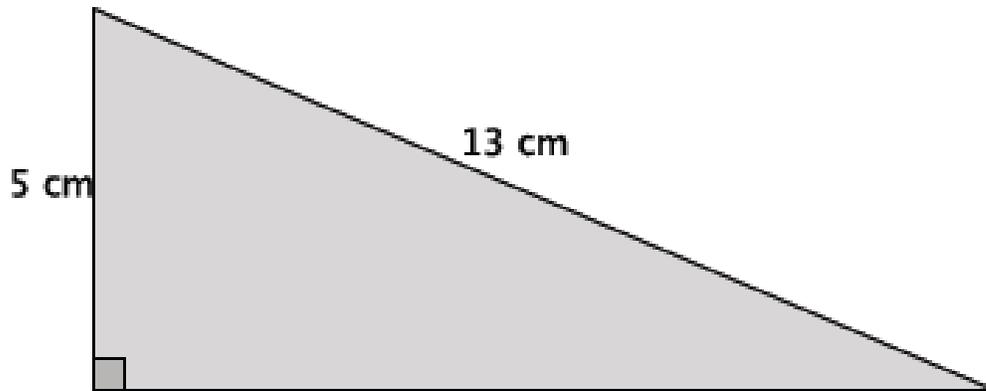
1. Determine the length of the unknown side of the right triangle. If not a perfect square, determine which two integers the length is between and the integer to which it is closest.



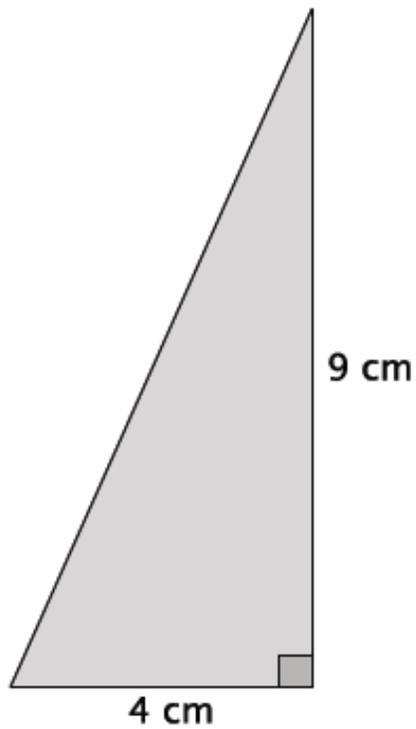
2. Determine the length of the unknown side of the right triangle. If not a perfect square, determine which two integers the length is between and the integer to which it is closest.



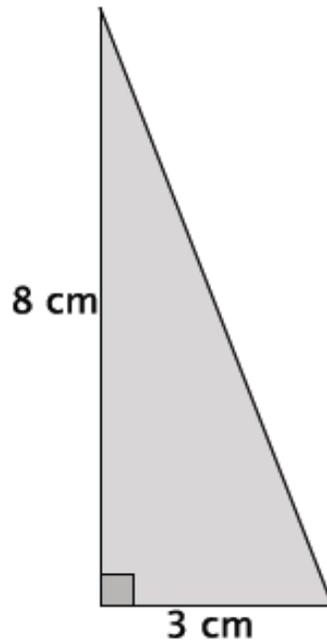
## Example 1



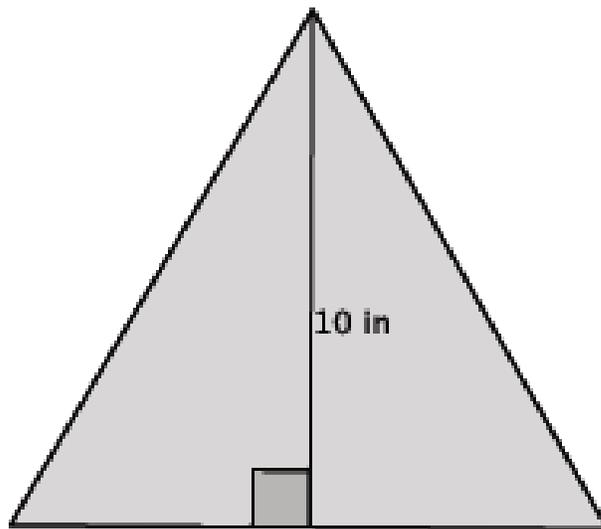
## Example 2



## Example 3



## Example 4



Name \_\_\_\_\_

Date \_\_\_\_\_

## Lesson 2: Square Roots

### Exit Ticket

1. Write the positive square root of a number  $x$  in symbolic notation.
2. Determine the positive square root of 196, if it exists. Explain.
3. Determine the positive square root of 50, if it exists. Explain.
4. Place the following numbers on the number line below:  $\sqrt{16}$ ,  $\sqrt{9}$ ,  $\sqrt{11}$ , 3.5.



Name \_\_\_\_\_

Date \_\_\_\_\_

## Lesson 3: Existence and Uniqueness of Square and Cube Roots

### Exit Ticket

Find the positive value of  $x$  that makes each equation true. Check your solution.

1.  $x^2 = 225$

a. Explain the first step in solving this equation.

b. Solve and check your solution.

2.  $x^3 = 512$

3.  $x^2 = 361^{-1}$

4.  $x^3 = 1000^{-1}$

Name \_\_\_\_\_

Date \_\_\_\_\_

## Lesson 4: Simplifying Square Roots

### Exit Ticket

Simplify the square roots as much as possible.

1.  $\sqrt{24}$

2.  $\sqrt{338}$

3.  $\sqrt{196}$

4.  $\sqrt{2,420}$

Name \_\_\_\_\_

Date \_\_\_\_\_

## Lesson 5: Solving Radical Equations

### Exit Ticket

1. Find the positive value of  $x$  that makes the equation true, and then verify your solution is correct.

$$x^2 + 4x = 4(x + 16)$$

2. Find the positive value of  $x$  that makes the equation true, and then verify your solution is correct.

$$(4x)^3 = 1728$$

Name \_\_\_\_\_

Date \_\_\_\_\_

## Lesson 6: Finite and Infinite Decimals

### Exit Ticket

Convert each fraction to a finite decimal. If the fraction cannot be written as a finite decimal, and then state how you know. Show your steps, but use a calculator for the multiplications.

1.  $\frac{9}{16}$

2.  $\frac{8}{125}$

3.  $\frac{4}{15}$

4.  $\frac{1}{200}$

Name \_\_\_\_\_

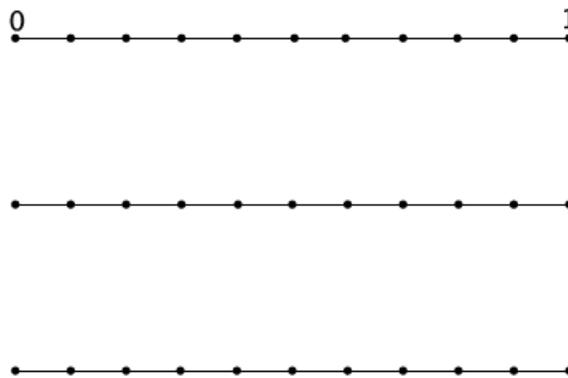
Date \_\_\_\_\_

## Lesson 7: Infinite Decimals

### Exit Ticket

1. a. Write the expanded form of the decimal 0.829 using powers of 10.

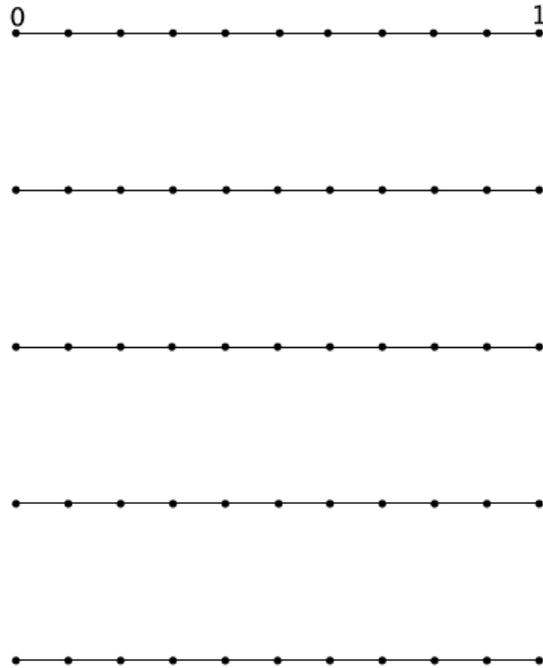
b. Show on the number line the representation of the decimal 0.829.



c. Is the decimal finite or infinite? How do you know?

2. a. Write the expanded form of the decimal 0.55555 ... using powers of 10.

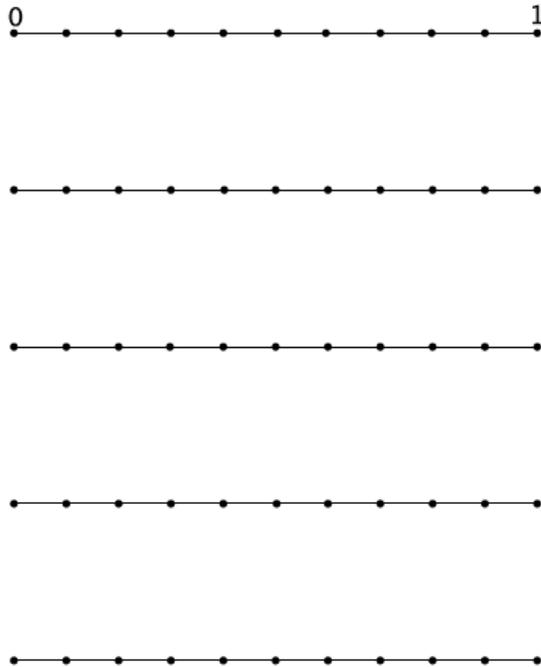
b. Show on the number line the representation of the decimal 0.555555 ...



c. Is the decimal finite or infinite? How do you know?

3. a. Write the expanded form of the decimal  $0.\overline{573}$  using powers of 10.

b. Show on the number line the representation of the decimal  $0.\overline{573}$ .



c. Is the decimal finite or infinite? How do you know?

Name \_\_\_\_\_

Date \_\_\_\_\_

## Lesson 8: The Long Division Algorithm

### Exit Ticket

1. Write the decimal expansion of  $\frac{125}{8}$ . Based on our definition of rational numbers having a decimal expansion that repeats eventually, is the number rational? Explain.

2. Write the decimal expansion of  $\frac{13}{7}$ . Based on our definition of rational numbers having a decimal expansion that repeats eventually, is the number rational? Explain.

Name \_\_\_\_\_

Date \_\_\_\_\_

## Lesson 9: Decimal Expansions of Fractions, Part 1

### Exit Ticket

1. Write the decimal expansion of  $\frac{823}{40}$ .

2. Write the decimal expansion of  $\frac{48}{21}$ .

Name \_\_\_\_\_

Date \_\_\_\_\_

## Lesson 10: Converting Repeating Decimals to Fractions

### Exit Ticket

1. Find the fraction equal to  $0.\overline{534}$ .

2. Find the fraction equal to  $3.0\overline{15}$ .

Name \_\_\_\_\_

Date \_\_\_\_\_

## Lesson 11: The Decimal Expansion of Some Irrational Numbers

### Exit Ticket

1. Determine the 3 decimal digit approximation of the number  $\sqrt{17}$ .

2. Classify the following numbers as rational or irrational, and explain how you know.

$$\frac{3}{5}, 0.73737373 \dots, \sqrt{31}$$

Name \_\_\_\_\_

Date \_\_\_\_\_

## Lesson 12: Decimal Expansions of Fractions, Part 2

### Exit Ticket

Use rational approximation to determine the decimal expansion of  $\frac{41}{6}$ .

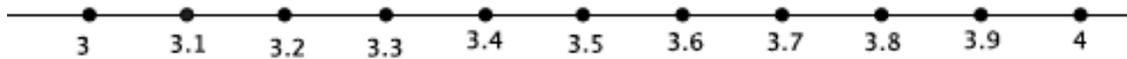
Name \_\_\_\_\_

Date \_\_\_\_\_

## Lesson 13: Comparison of Irrational Numbers

### Exit Ticket

Place the following numbers at their approximate location on the number line:  $\sqrt{12}$ ,  $\sqrt{16}$ ,  $\frac{20}{6}$ ,  $3.\overline{53}$ ,  $\sqrt[3]{27}$ .



Name \_\_\_\_\_

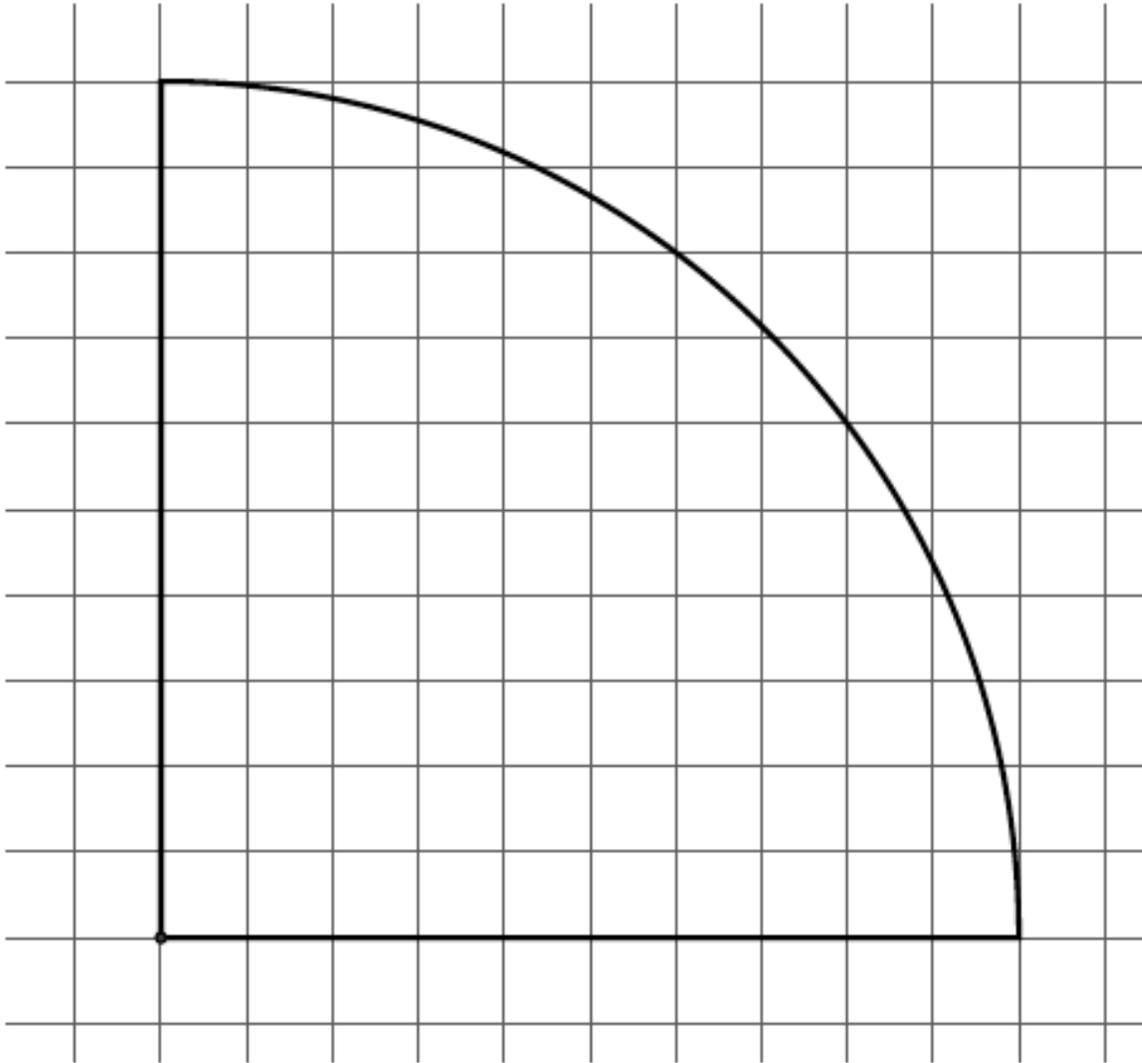
Date \_\_\_\_\_

## Lesson 14: The Decimal Expansion of $\pi$

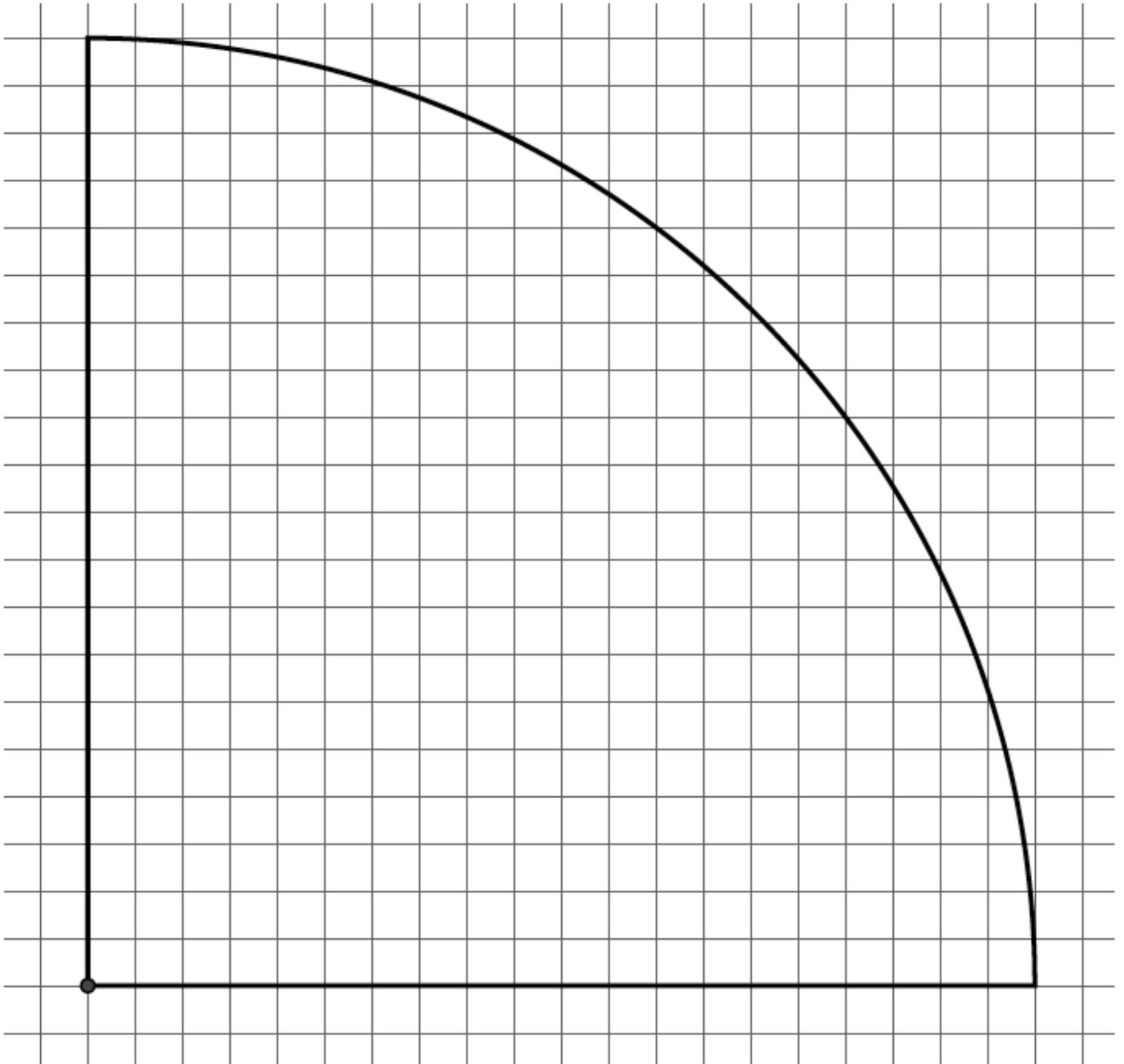
### Exit Ticket

Describe how we found a decimal approximation for  $\pi$ .

## 10 by 10 Grid



20 by 20 Grid



Name \_\_\_\_\_

Date \_\_\_\_\_

1. a. What is the decimal expansion of the number  $\frac{35}{7}$ ? Is the number  $\frac{35}{7}$  rational or irrational? Explain.

b. What is the decimal expansion of the number  $\frac{4}{33}$ ? Is the number  $\frac{4}{33}$  rational or irrational? Explain.

2. a. Write  $0.\overline{345}$  as a fraction.

b. Write  $2.\overline{840}$  as a fraction.

c. Brandon stated that  $0.66$  and  $\frac{2}{3}$  are equivalent. Do you agree? Explain why or why not.

d. Between which two positive integers does  $\sqrt{33}$  lie?

e. For what integer  $x$  is  $\sqrt{x}$  closest to 5.25? Explain.

3. Identify each of the following numbers as rational or irrational. If the number is irrational, explain how you know.

a.  $\sqrt{29}$

b.  $5.\overline{39}$

c.  $\frac{12}{4}$

d.  $\sqrt{36}$

e.  $\sqrt{5}$

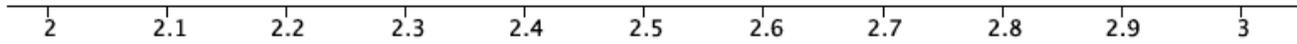
f.  $\sqrt[3]{27}$

g.  $\pi = 3.141592 \dots$

h. Order the numbers in parts (a)–(g) from least to greatest, and place on a number line.

4. Circle the greater number in each of the pairs (a)–(e) below.
- a. Which is greater? 8 or  $\sqrt{60}$
- b. Which is greater? 4 or  $\sqrt{26}$
- c. Which is greater?  $\sqrt[3]{64}$  or  $\sqrt{16}$
- d. Which is greater?  $\sqrt[3]{125}$  or  $\sqrt{30}$
- e. Which is greater?  $-7$  or  $-\sqrt{42}$
- f. Put the numbers 9,  $\sqrt{52}$ , and  $\sqrt[3]{216}$  in order from least to greatest. Explain how you know which order to put them in.

5.



a. Between which two labeled points on the number line would  $\sqrt{5}$  be located?

b. Explain how you know where to place  $\sqrt{5}$  on the number line.

c. How could you improve the accuracy of your estimate?

6. Determine the position solution for each of the following equations.

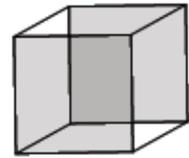
a.  $121 = x^2$

b.  $x^3 = 1000$

c.  $17 + x^2 = 42$

d.  $x^3 + 3x - 9 = x - 1 + 2x$

- e. The cube shown has a volume of  $216 \text{ cm}^3$ .
- i. Write an equation that could be used to determine the length,  $l$ , of one side.



$$V = 216 \text{ cm}^3$$

- ii. Solve the equation, and explain how you solved it.

Name \_\_\_\_\_

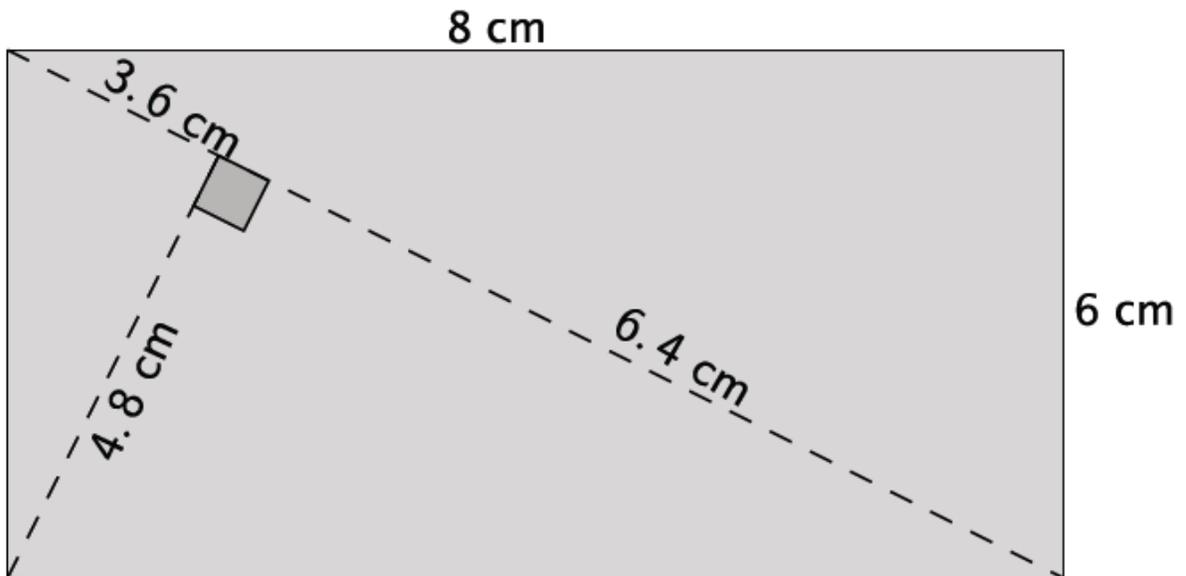
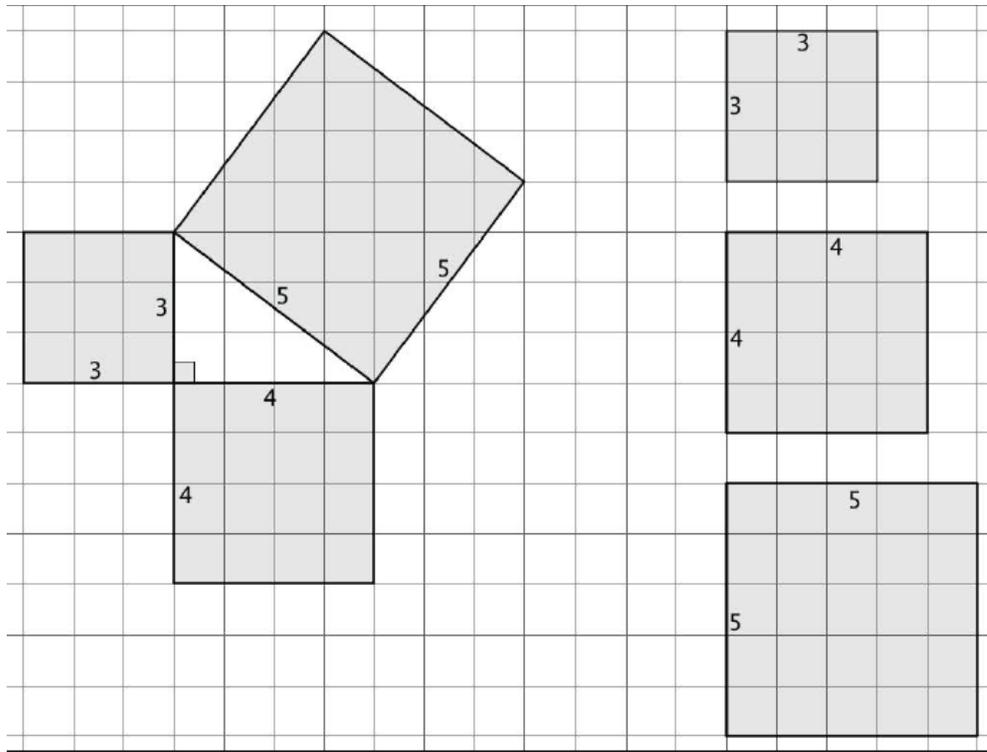
Date \_\_\_\_\_

## Lesson 15: The Pythagorean Theorem, Revisited

### Exit Ticket

Explain a proof of the Pythagorean Theorem in your own words. Use diagrams and concrete examples, as necessary, to support your explanation.

Diagrams referenced in scaffolding boxes can be reproduced for use student use.





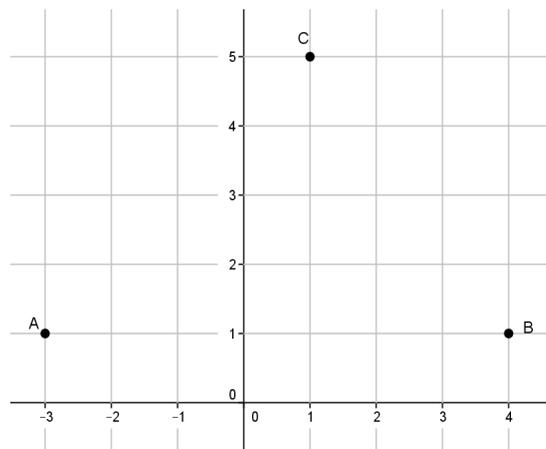
Name \_\_\_\_\_

Date \_\_\_\_\_

## Lesson 17: Distance on the Coordinate Plane

### Exit Ticket

Use the following diagram to answer the questions below.



1. Determine  $|AC|$ . Leave your answer in square root form unless it is a perfect square.
2. Determine  $|CB|$ . Leave your answer in square root form unless it is a perfect square.
3. Is the triangle formed by the points  $A, B, C$  a right triangle? Explain why or why not.

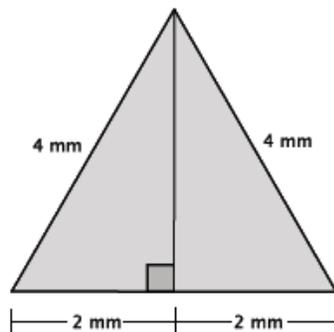
Name \_\_\_\_\_

Date \_\_\_\_\_

## Lesson 18: Applications of the Pythagorean Theorem

### Exit Ticket

1. Use the diagram of the equilateral triangle shown below to answer the following questions. Show work that leads to your answers.



- a. What is the perimeter of the triangle?
- b. What is the height,  $h$ , of the equilateral triangle? Write an exact answer using a square root and approximate answer rounded to the tenths place.
- c. Using the approximate height found in part (b), estimate the area of the equilateral triangle.

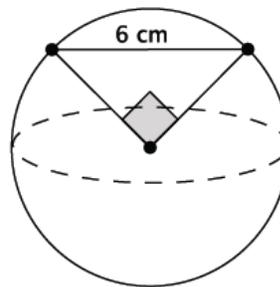
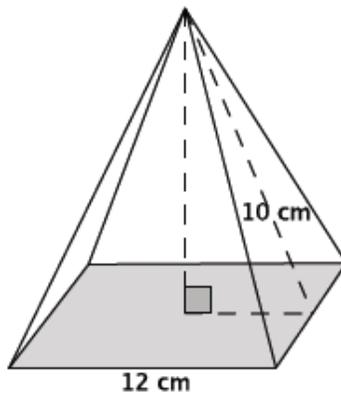
Name \_\_\_\_\_

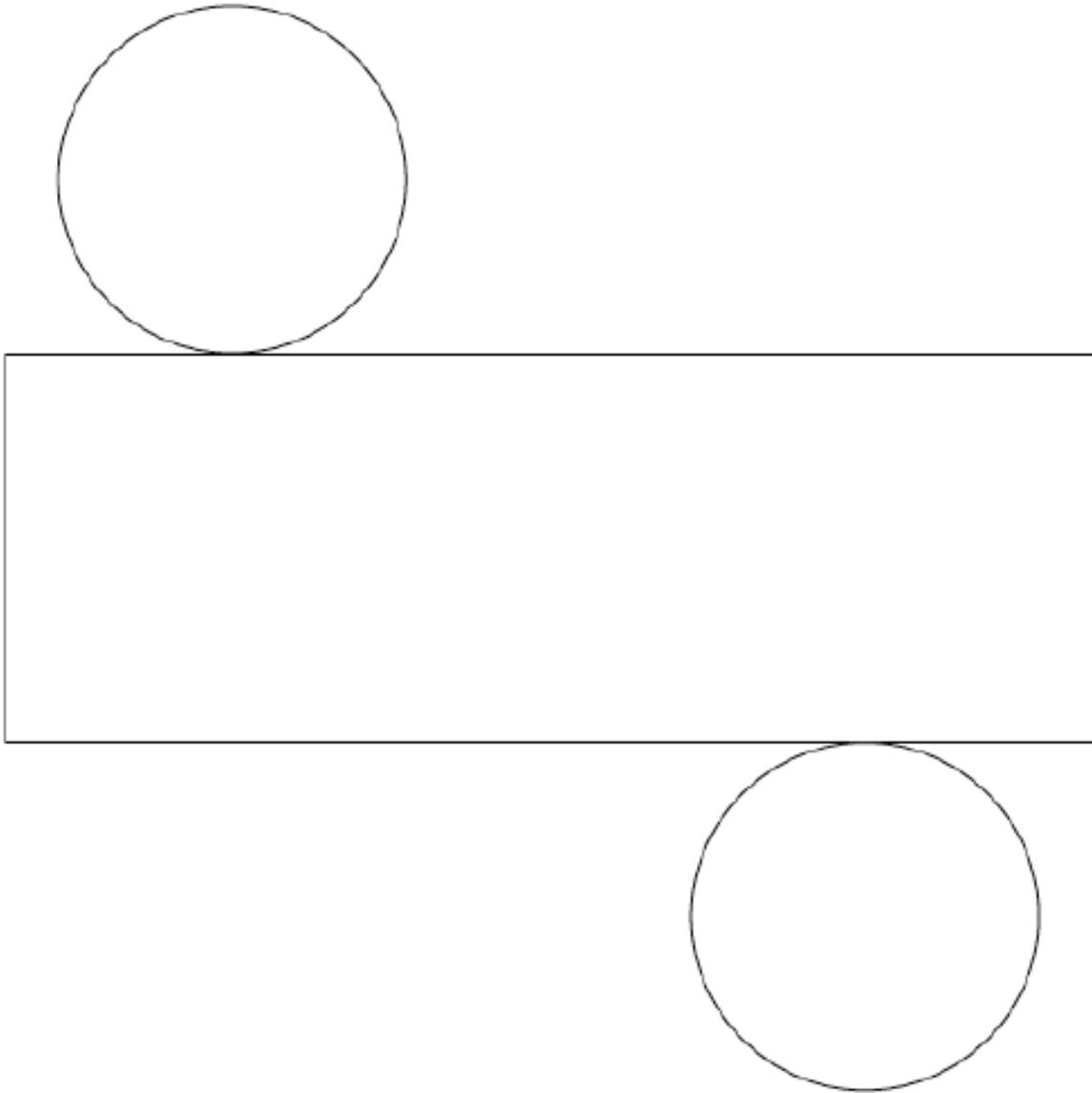
Date \_\_\_\_\_

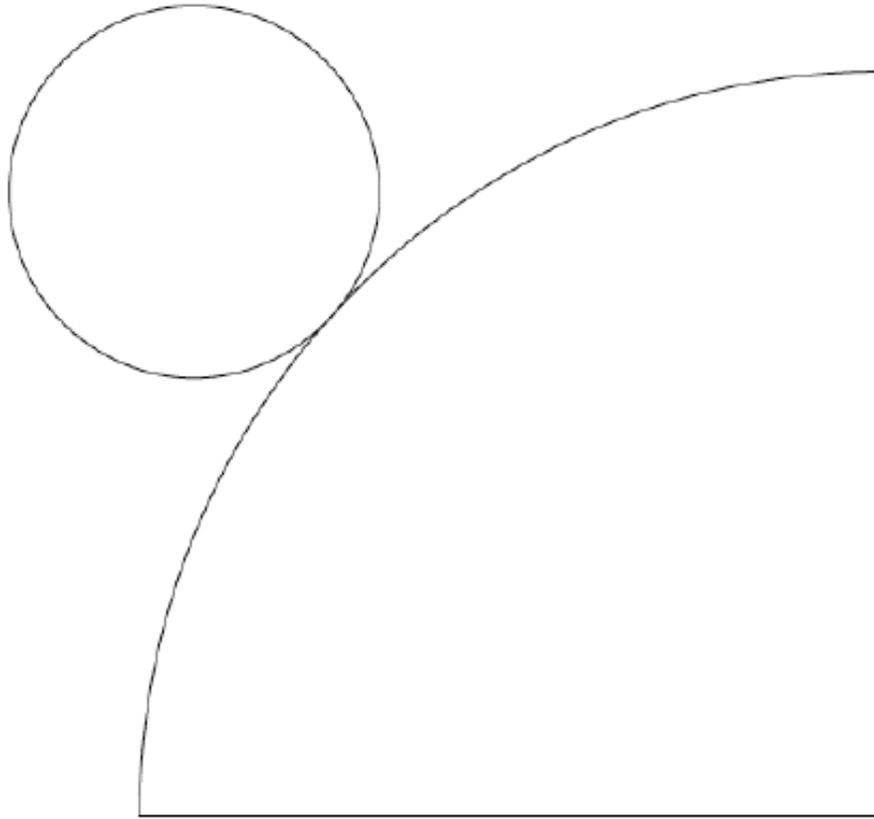
## Lesson 19: Cones and Spheres

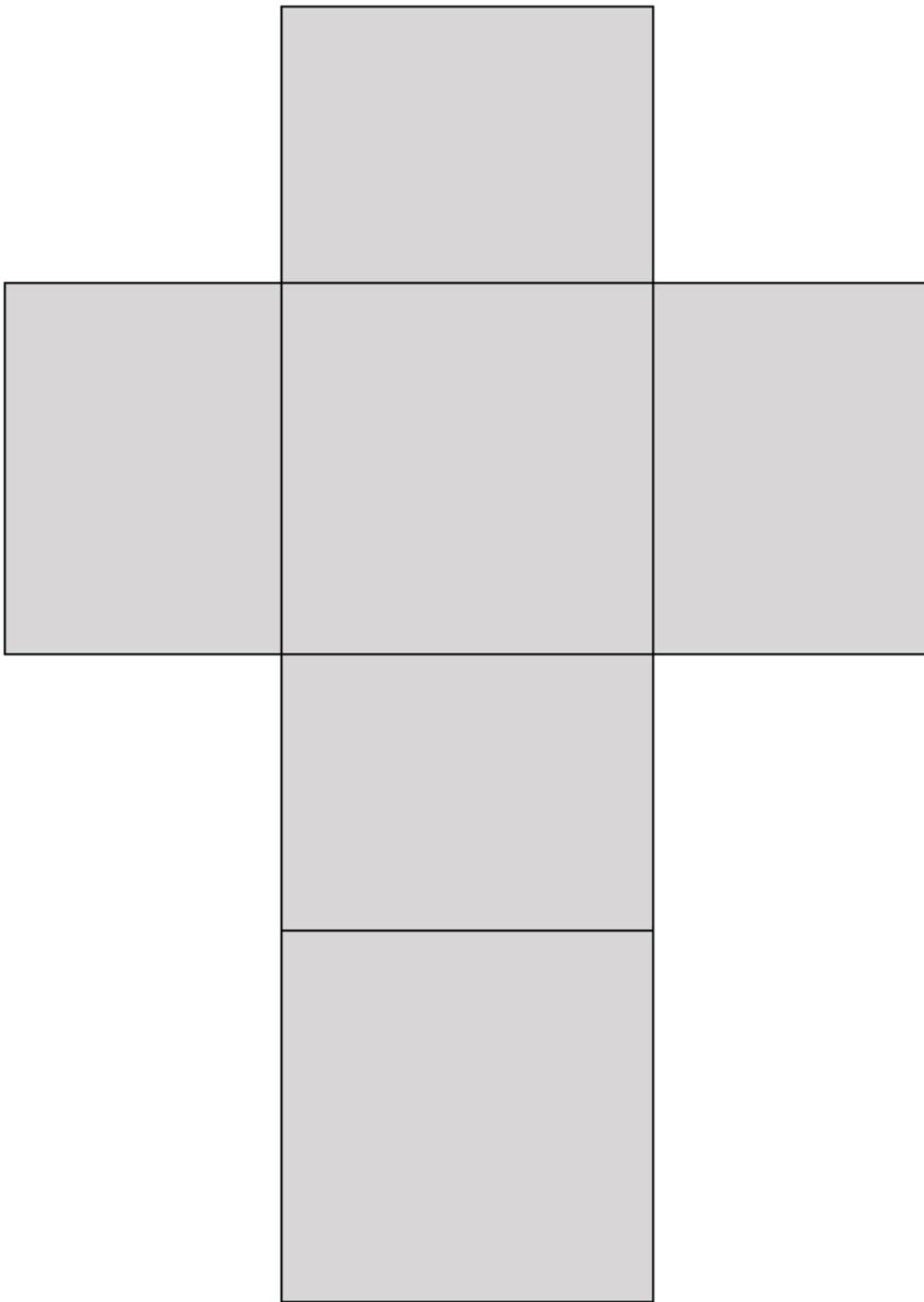
### Exit Ticket

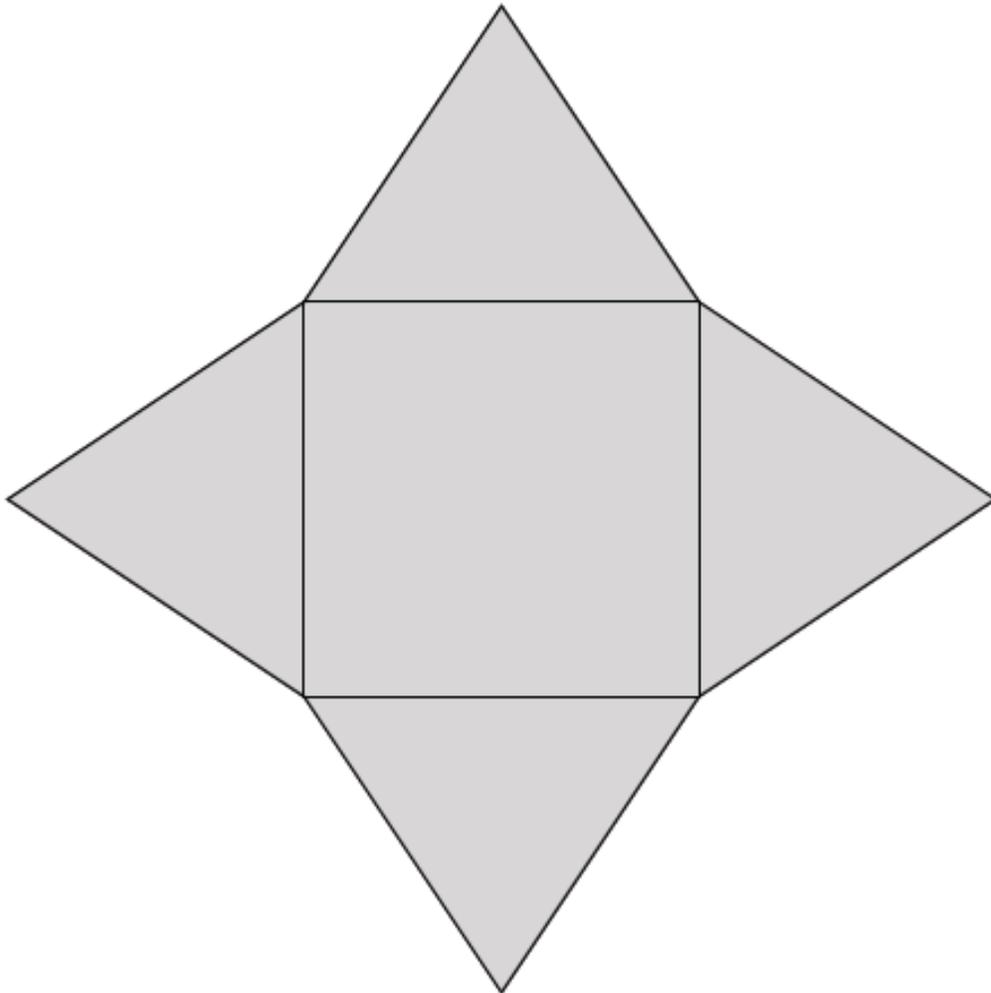
Which has the larger volume? Give an approximate answer rounded to the tenths place.











Name \_\_\_\_\_

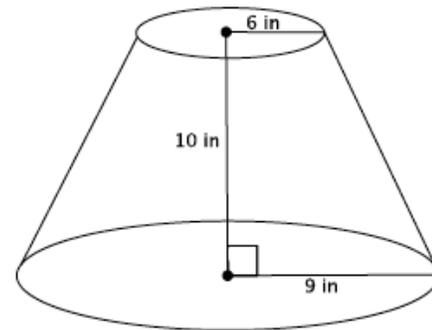
Date \_\_\_\_\_

## Lesson 20: Truncated Cones

### Exit Ticket

Find the volume of the truncated cone.

- a. Write a proportion that will allow you to determine the height of the cone that has been removed. Explain what all parts of the proportion represent.



- b. Solve your proportion to determine the height of the cone that has been removed.
- c. Write an expression that can be used to determine the volume of the truncated cone. Explain what each part of the expression represents.
- d. Calculate the volume of the truncated cone.

Name \_\_\_\_\_

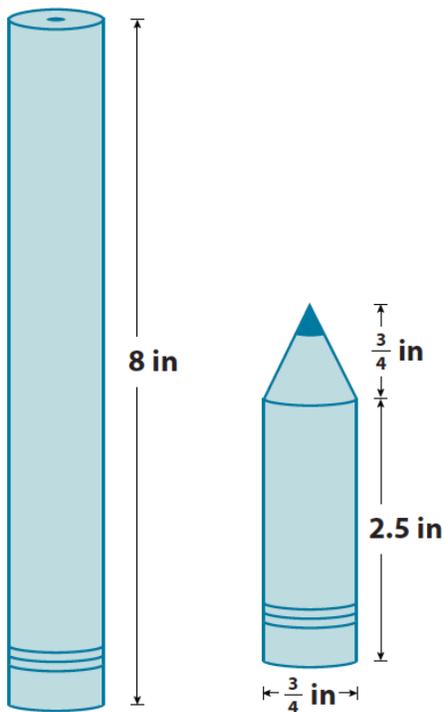
Date \_\_\_\_\_

## Lesson 21: Volume of Composite Solids

### Exit Ticket

Andrew bought a new pencil like the one shown below on the left. He used the pencil every day in his math class for a week, and now his pencil looks like the one shown below on the right. How much of the pencil, in terms of volume, did he use?

Note: Figures not drawn to scale.



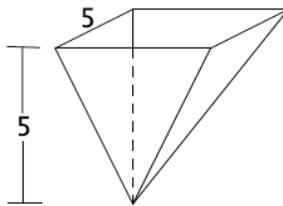
Name \_\_\_\_\_

Date \_\_\_\_\_

## Lesson 22: Average Rate of Change

### Exit Ticket

1. A container in the shape of a square base pyramid has a height of 5 ft. and a base length of 5 ft., as shown. Water flows into the container (in its inverted position) at a constant rate of  $4 \text{ ft}^3$  per minute. Calculate the number of minutes it would take to fill the cone at 1 ft. intervals. Organize your data in the table below.



Water level in feet	Area of base in $\text{ft}^2$	Volume in $\text{ft}^3$	Time in minutes
1			
2			
3			
4			
5			

- a. How long will it take to fill up the container?
- b. Show that the water level is not rising at a constant rate. Explain.

Name \_\_\_\_\_

Date \_\_\_\_\_

## Lesson 23: Nonlinear Motion

### Exit Ticket

Suppose a book is 5.5 inches long and leaning on a shelf. The top of the book is sliding down the shelf at a rate of 0.5 in. per second. Complete the table below. Then compute the average rate of change in the position of the bottom of the book over the intervals of time from 0 to 1 second and 10 to 11 seconds. How do you interpret these numbers?

Input $t$	Output $y = \sqrt{0.5t(11 - 0.5t)}$
0	
1	
2	
3	
4	
5	
6	
7	
8	
9	
10	
11	

Name \_\_\_\_\_

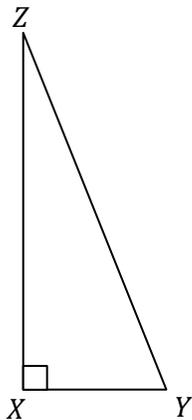
Date \_\_\_\_\_

When using a calculator to complete the assessment, use the  $\pi$  key and the full display of the calculator for computations.

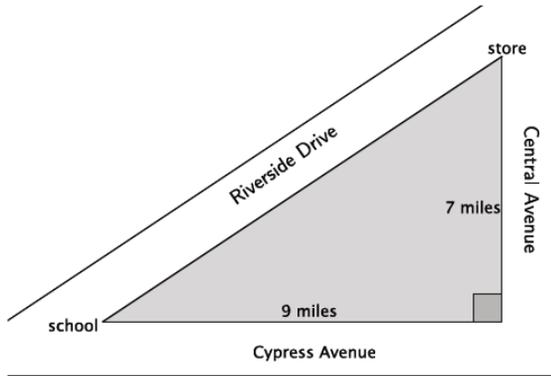
1. a. Is a triangle with side lengths of 7 cm, 24 cm, and 25 cm a right triangle? Explain.

b. Is a triangle with side lengths of 4 mm, 11 mm, and 15 mm a right triangle? Explain.

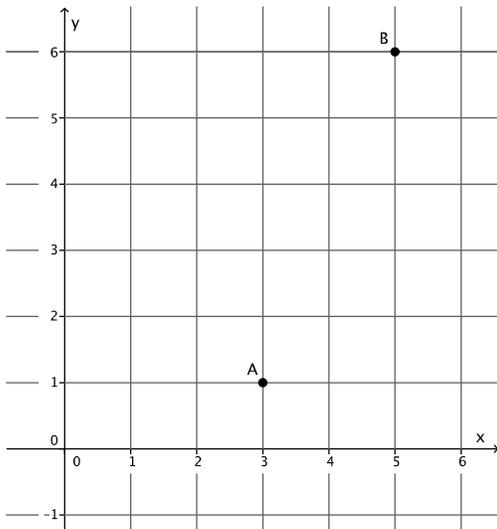
c. The area of the right triangle shown below is  $30 \text{ ft}^2$ . The segment  $\overline{XY}$  has a length of 5 ft. Find the length of the hypotenuse.



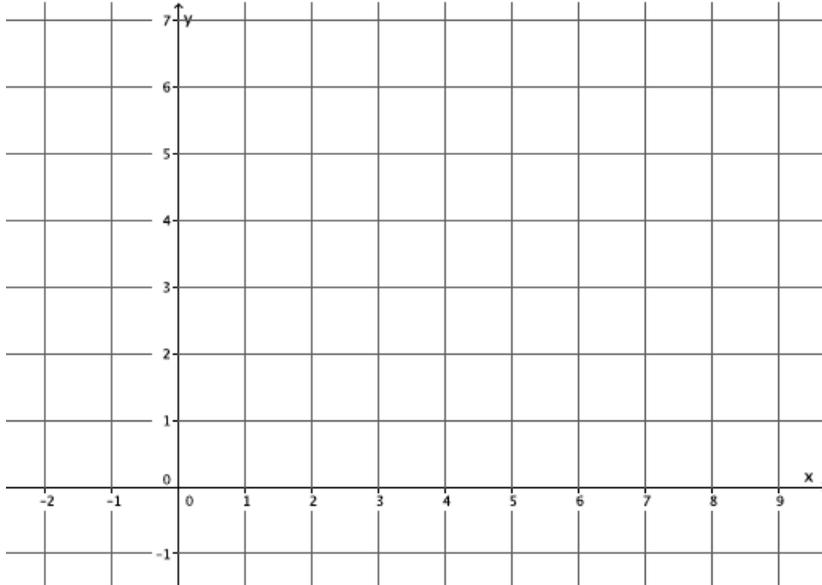
- d. Two paths from school to the store are shown below, one that uses Riverside Drive and another which uses Cypress and Central Avenues. Which path is shorter? By about how much? Explain how you know.



- e. What is the distance between points  $A$  and  $B$ ?



- f. Do the segments connecting the coordinates  $(-1,6)$ ,  $(4,2)$ , and  $(7,6)$  form a right triangle? Show work that leads to your answer.

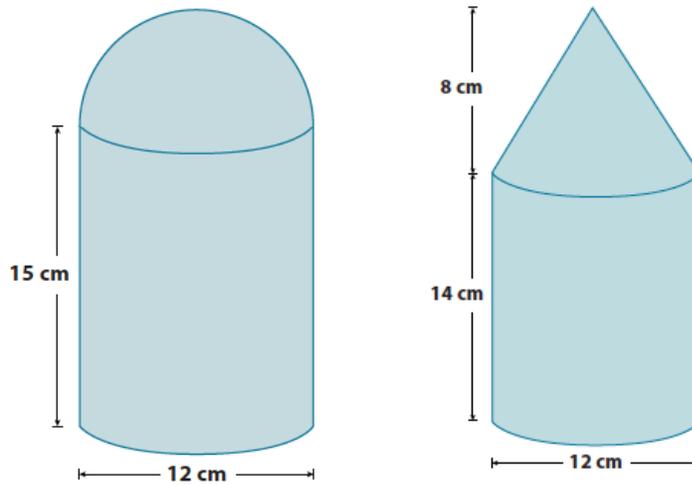


- g. Using an example, illustrate and explain the Pythagorean Theorem.

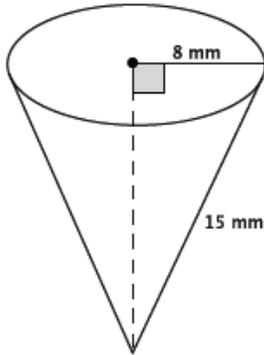
- h. Using a different example than part (g), illustrate and explain the converse of the Pythagorean Theorem.
- i. Explain a proof of the Pythagorean Theorem and its converse.

2. Dorothy wants to purchase a container that will hold the most sugar. Assuming each of the containers below can be completely filled with sugar, write a note recommending a container, including justification for your choice.

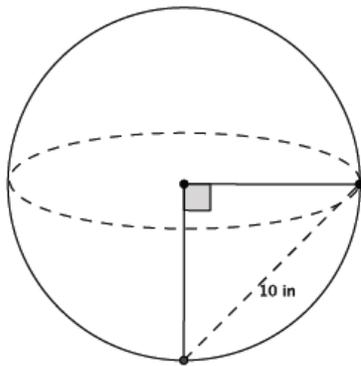
Note: Figures not drawn to scale.



3. a. Determine the volume of the cone shown below. Give an answer in terms of  $\pi$  and an approximate answer rounded to the tenths place.



- b. The distance between the two points on the surface of the sphere shown below is 10 units. Determine the volume of the sphere. Give an answer in terms of  $\pi$  and an approximate answer rounded to a whole number.



- c. A sphere has a volume of  $457\frac{1}{3}\pi$  in.<sup>3</sup>. What is the radius of the sphere?