

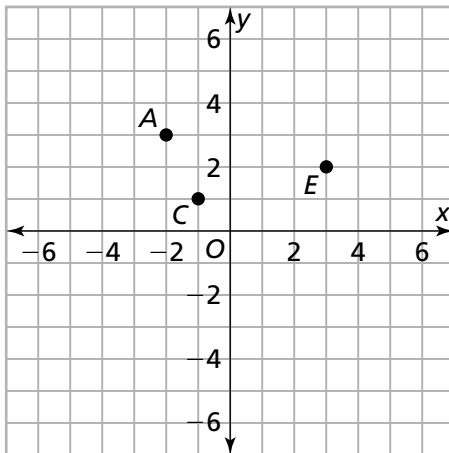
Question Bank

Looking for Pythagoras

1. Kathy heard her teacher say that every fraction can be written as a decimal that either repeats or terminates. She tried $\frac{15}{7}$ on her calculator to confirm this, and it gave her an answer of 2.142857143. She was not sure whether this decimal is repeating or terminating, so she worked the problem out by hand as shown. When she reached this point in her division, she said, “Now I see that this decimal will repeat.” What is Kathy’s evidence that this is a repeating decimal?

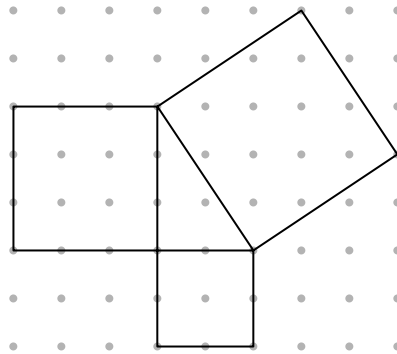
$$\begin{array}{r} 2.1428571 \\ 7 \overline{)15.00000000} \\ \underline{14} \\ 10 \\ \underline{7} \\ 30 \\ \underline{28} \\ 20 \\ \underline{14} \\ 60 \\ \underline{56} \\ 40 \\ \underline{35} \\ 50 \\ \underline{49} \\ 10 \end{array}$$

2. a. The points A , C , and E are labeled on the grid. Place a fourth vertex S to form parallelogram $ACES$. Give the coordinates of vertex S .

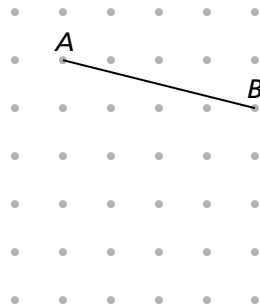


- b. Explain how you decided where to put vertex S . What facts about the parallelogram helped you to decide on the position?
- c. Is there another way to make a parallelogram using points A , C , and E and a fourth vertex? If so, locate the fourth vertex. If not, explain why not.

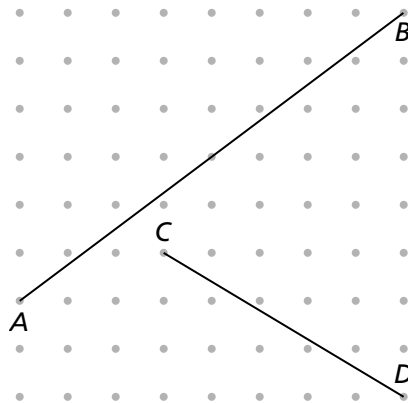
3. a. Find the area of each square below.



- b. Describe any relationship you notice in your answer to part (a).
4. Without using a ruler, find the length of segment AB .

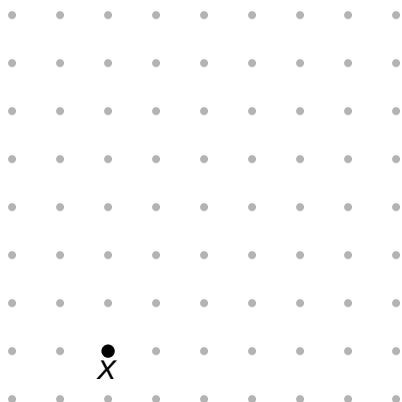


5. Use the Pythagorean Theorem to find the length of each line segment. Show all work you do to find your solutions.

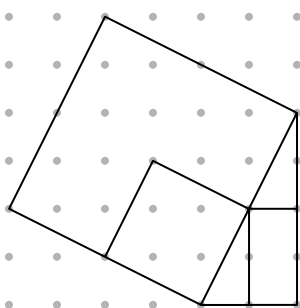


- a. What is the length of segment AB ?
- b. What is the length of segment CD ?

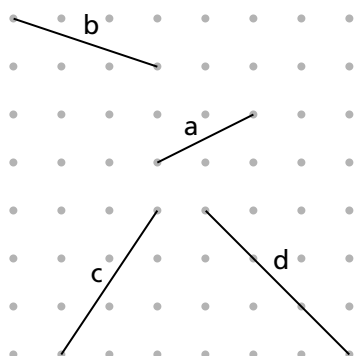
6. Redbeard's treasure is buried at one of the grid points shown below at a distance of $\sqrt{13}$ from the X . Where could the treasure be? Explain how you located a possible position.



7. Celia's brother says his algebra teacher said that $\sqrt{20}$ is the same as $2 \cdot \sqrt{5}$, but this does not seem correct to him. Celia made this sketch to explain why this is indeed true. Explain how Celia used her sketch to help her brother understand.



8. Find the slopes of all the line segments on the grid.



slope of line a : _____

slope of line b : _____

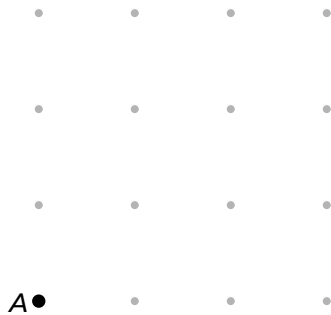
slope of line c : _____

slope of line d : _____

Question Bank *(continued)*

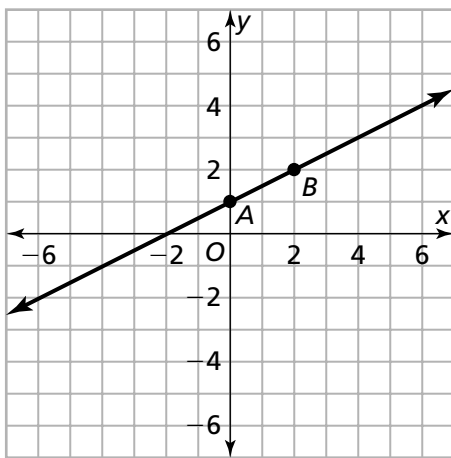
Looking for Pythagoras

9. a. Starting at point A , use a ruler to draw as many line segments as you can, all with different slopes. Each line segment must start at A and end at another grid point. Give the slope of each line segment.



- b. How do you know you have drawn all the possible line segments?

10.

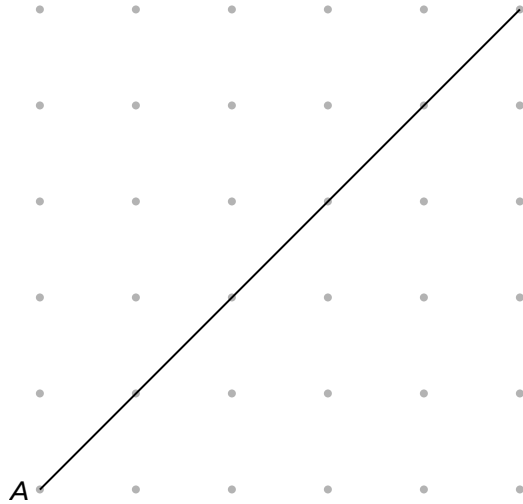


- Give the coordinates of points A and B .
- What is the slope of line AB ?
- What is an equation of line AB ?

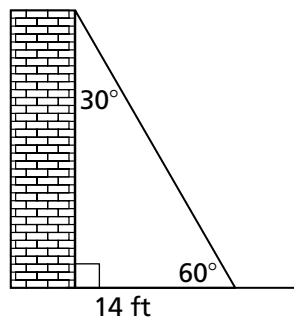
Question Bank *(continued)*

Looking for Pythagoras

11. a. Starting at point A , use a ruler to draw and label line segments on the grid below with slopes 1 , $\frac{1}{2}$, $\frac{1}{3}$, $\frac{1}{4}$, and $\frac{1}{5}$. (The first line segment is drawn as an example.)



- b. Using a different color, draw and label more line segments, all starting at point A , with slopes of $\frac{2}{1}$, $\frac{2}{2}$, $\frac{2}{3}$, $\frac{2}{4}$, and $\frac{2}{5}$.
- c. Are any of the line segments you drew in part (b) the same as the line segments you drew in part (a)? Explain why this does or does not happen.
12. Wire is strung between a building and the ground, making a 30-60-90 triangle as shown. The wire is attached to the ground 14 feet from the building.



- a. How long must the wire be?
- b. How far up the side of the building is the wire attached?