

Good morning!

1. "Here"

2. Notes on Pythagorean Theorem and Distance Formula

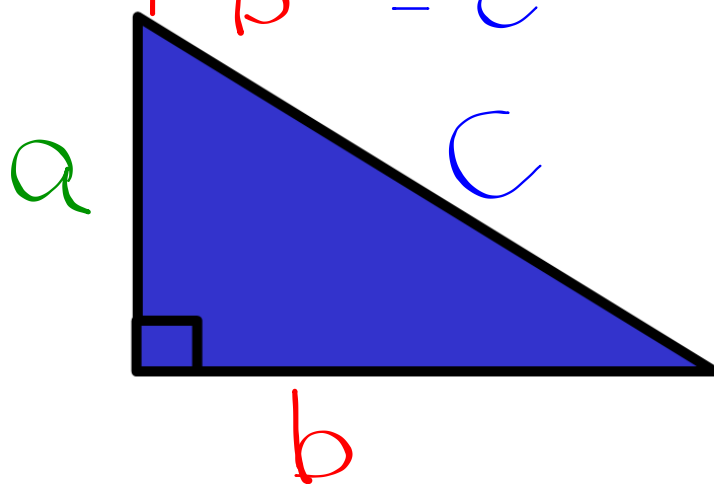
3. Practice

4. Perimeter Picture will be due on Monday,  
11/16

On the quiz, you can earn half points by completing DeltaMath Review.

# Pythagorean Theorem

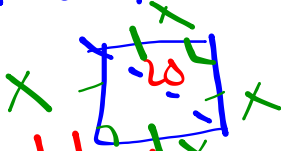
$$\text{leg}^2 + \text{leg}^2 = \text{hyp}^2$$
$$a^2 + b^2 = c^2$$



## Pythagorean Theorem Word Problems

- A square has a diagonal with length of 20 cm. What is the measure of each side? Round to the nearest tenths.

① Draw Picture



② Highlight information

$$x = 14.1 \text{ cm}$$

③ Choose formula

Right  $\triangle$

$$a^2 + b^2 = c^2$$

$$x^2 + x^2 = 20^2$$

$$\frac{2x^2}{2} = \frac{400}{2}$$

④ Solve question

$$\sqrt{x^2} = \sqrt{200}$$

$$x = 14.14 \approx 14.1 \text{ cm}$$

## Pythagorean Theorem Word Problems

- What is the length of the altitude of an equilateral triangle if a side is 12 cm?  
Round to the nearest tenths.

① Draw picture



② Highlight information

$$x = 10.4 \text{ cm}$$

③ Choose formula

$$a^2 + b^2 = c^2$$

$$a^2 + 6^2 = 12^2$$

④ Solve question.

$$a^2 = 12^2 - 6^2$$

$$144 - 36$$

$$\sqrt{a^2} = \sqrt{108}$$

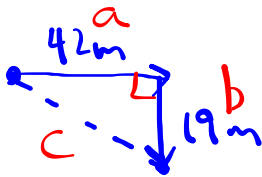
$$a = 10.4 \text{ cm}$$

## Pythagorean Theorem Word Problems

- Ashley travels 42 miles east, then 19 miles south. How far is Ashley from the starting point? Round to the nearest tenths.



① Draw Picture



$$x = 46.1 \text{ miles}$$

②

$$\textcircled{3} \quad a^2 + b^2 = c^2$$

$$42^2 + 19^2 = c^2$$

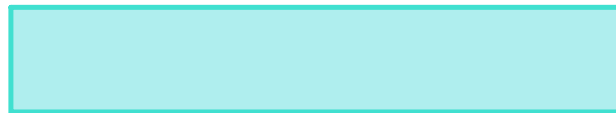
$$1764 + 361$$

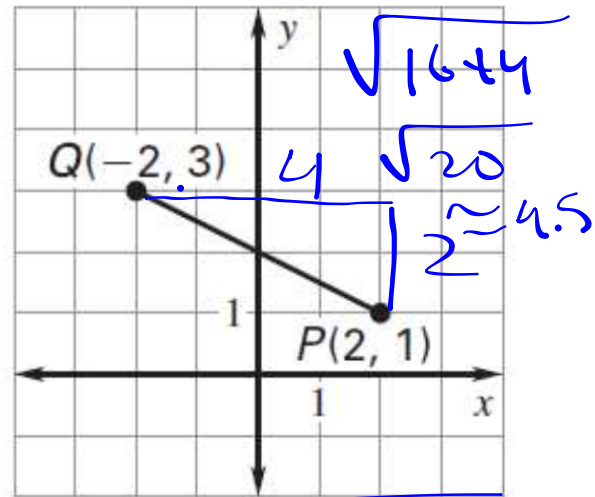
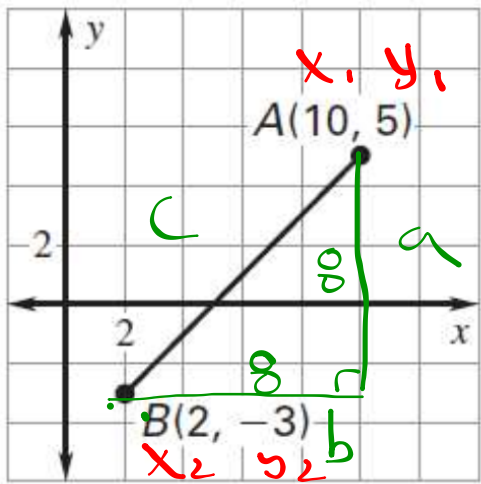
$$\sqrt{2125} = \sqrt{c^2}$$

④

$$46.1 = c$$

mi





Distance

$$\sqrt{(x_2 - x_1)^2 + (y_2 - y_1)^2}$$

$$\sqrt{(-8)^2 + (-8)^2}$$

$$\sqrt{64 + 64}$$

$$\sqrt{128}$$

$$\approx 11.31$$

$$c = \sqrt{a^2 + b^2}$$

$$\sqrt{4^2 + 2^2} = c$$

$$8^2 + 8^2 = c^2$$

$$\sqrt{64 + 64} = \sqrt{c^2}$$

$$c = \sqrt{a^2 + b^2}$$

$$c \approx 11.31$$

# The Distance Formula

$$(x_1, y_1)$$

$$(x_2, y_2)$$

$$\text{Slope } m = \frac{y_2 - y_1}{x_2 - x_1}$$

$$D = \sqrt{\left( (x_2 - x_1)^2 + (y_2 - y_1)^2 \right)}$$



**Example**

Find the distance between (1, 4) and (-2, 3).  
Round to the nearest hundredths.

$$D = \sqrt{(x_2 - x_1)^2 + (y_2 - y_1)^2} \text{ or } a^2 + b^2 = c^2$$

$$D = \sqrt{(-2 - 1)^2 + (3 - 4)^2} \quad (-1)^2 + (-1)^2 = c^2$$

$$D = \sqrt{(-3)^2 + (-1)^2} \quad 1 + 9 = c^2$$

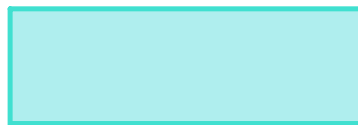
$$D = \sqrt{9 + 1}$$

$$\sqrt{10} = c$$

$$D = 3.16$$

$$D = \sqrt{10} \rightarrow$$

$$c = 3.16$$



**Example**

Find the distance between the points, (10, 5) and (40, 45). Round to the nearest hundredths.

$$D = \sqrt{(x_2 - x_1)^2 + (y_2 - y_1)^2}$$

$$D = \sqrt{(40 - 10)^2 + (45 - 5)^2}$$

$$D = \sqrt{30^2 + 40^2}$$

$$D = \sqrt{2500}$$

$$D = 50$$

$$\mathbf{D = 50}$$

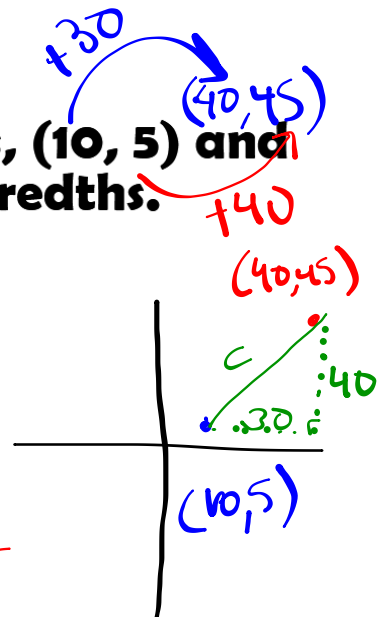
$$c^2 = a^2 + b^2$$

$$c^2 = 30^2 + 40^2$$

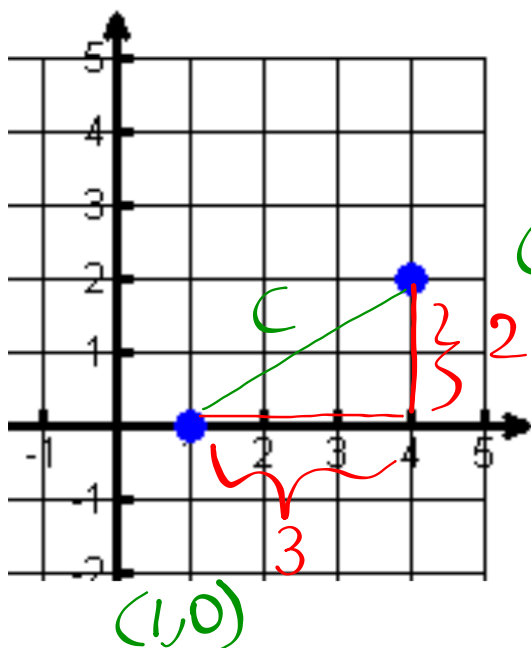
$$c^2 = 900 + 1600$$

$$\sqrt{c^2} = \sqrt{2500}$$

$$c = 50$$



3. Find the distance between the points.  
Round to the nearest tenths.



$$a^2 + b^2 = c^2$$

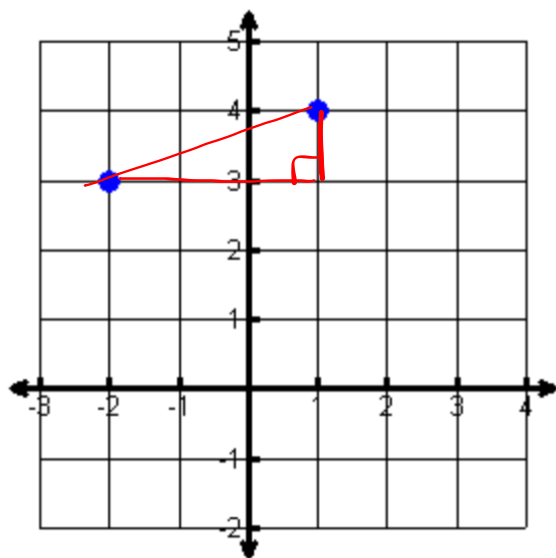
$$3^2 + 2^2 = c^2$$

$$9 + 4$$

$$\sqrt{13} = \sqrt{c^2}$$

$$c = 3.6$$

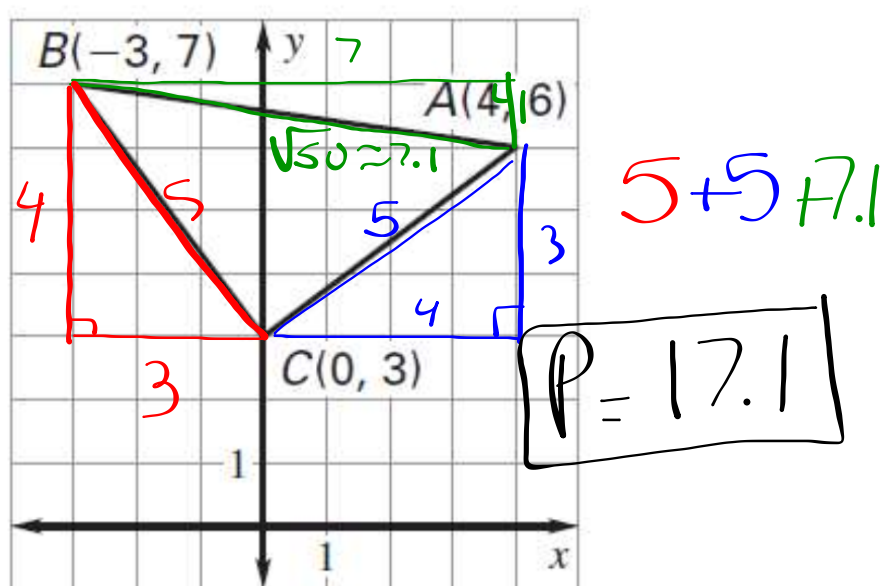
4. Find the distance between the points.  
Round to the nearest tenths.

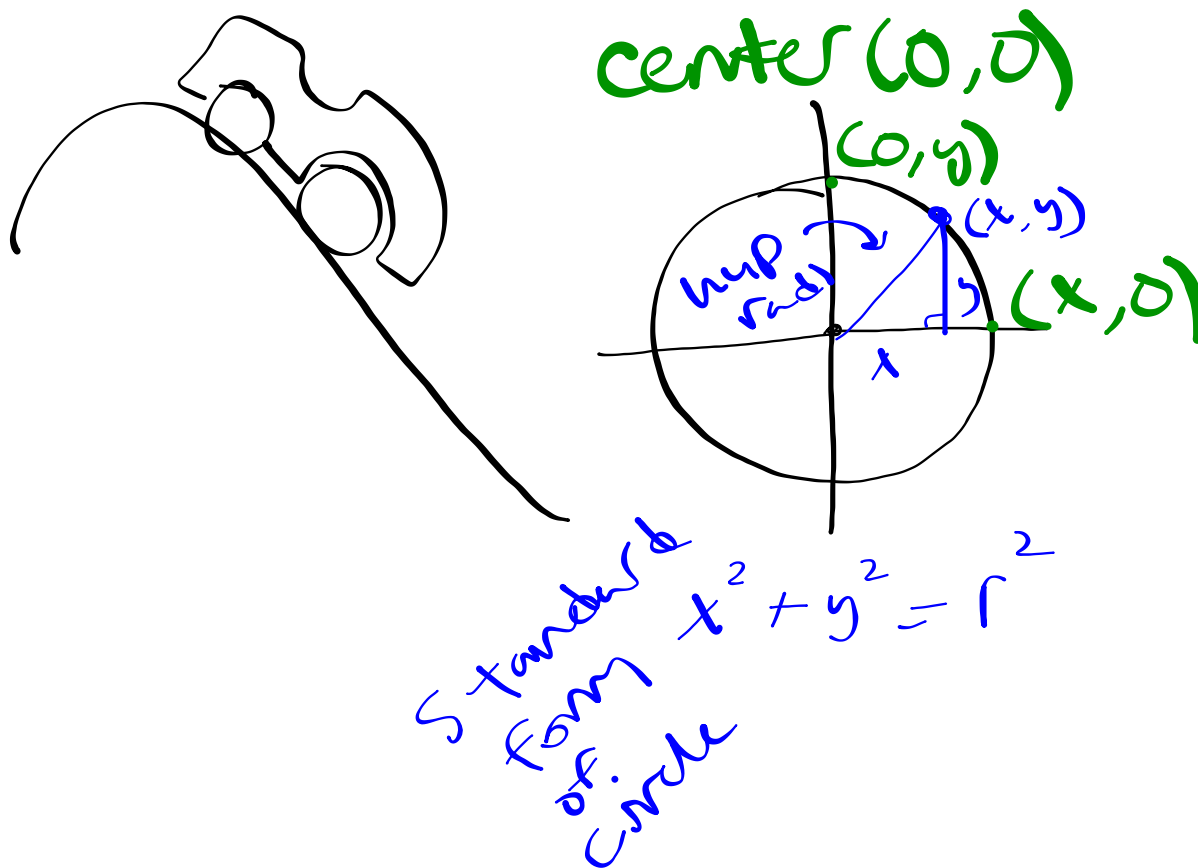


$$D = 3.2$$

$$3.16 \rightarrow 3.2$$

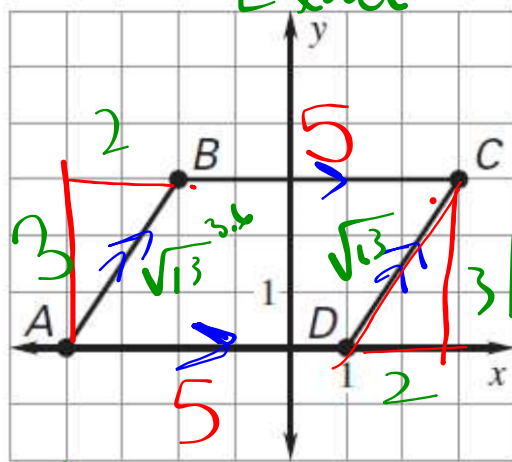
# Find the Perimeter





# Find the Perimeter

Exact



$$\begin{aligned}
 3^2 + 2^2 &= c^2 \\
 9 + 4 & \\
 \sqrt{13} &= c
 \end{aligned}$$

$$P = 5 + 5 + \sqrt{13} + \sqrt{13}$$

$$P = 10 + 2\sqrt{13}$$

Exact

OR

$$P \approx 17.2$$

Round

**Distance, Pythagorean, and Perimeter**

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

**Directions:** Find the distance between the following set of coordinates.

1.  $(7, 3), (-1, -4)$

2.  $(3, -5), (-3, 0)$

3.  $(6, -7), (3, -5)$

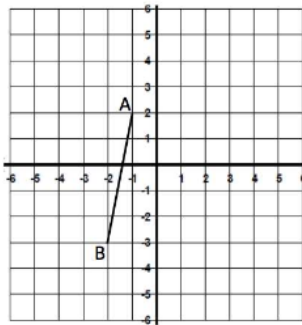
4.  $(5, 1), (5, -6)$

5.  $(1, 4), (2, 5)$

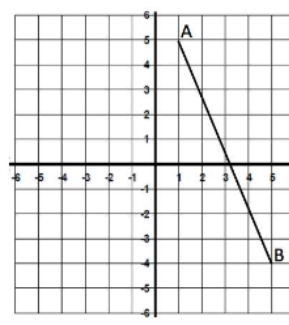
6.  $(-2, 1), (1, 8)$

**Directions:** Find the distance of the segment on each graph by using the Pythagorean Theorem.

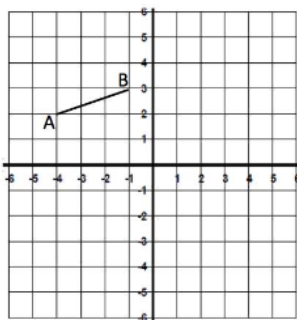
7.



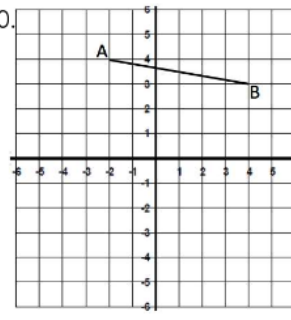
8.



9.

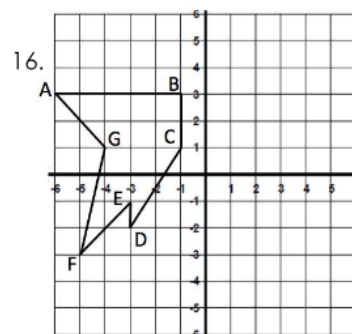
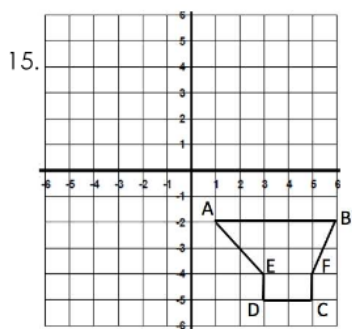
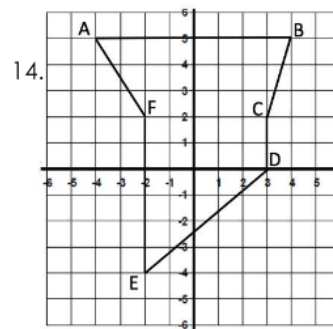
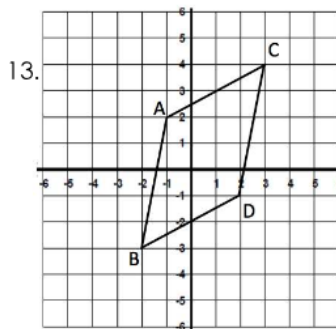
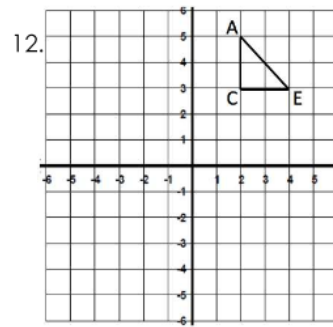
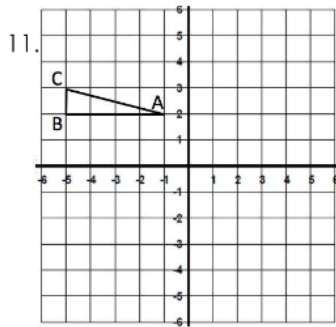


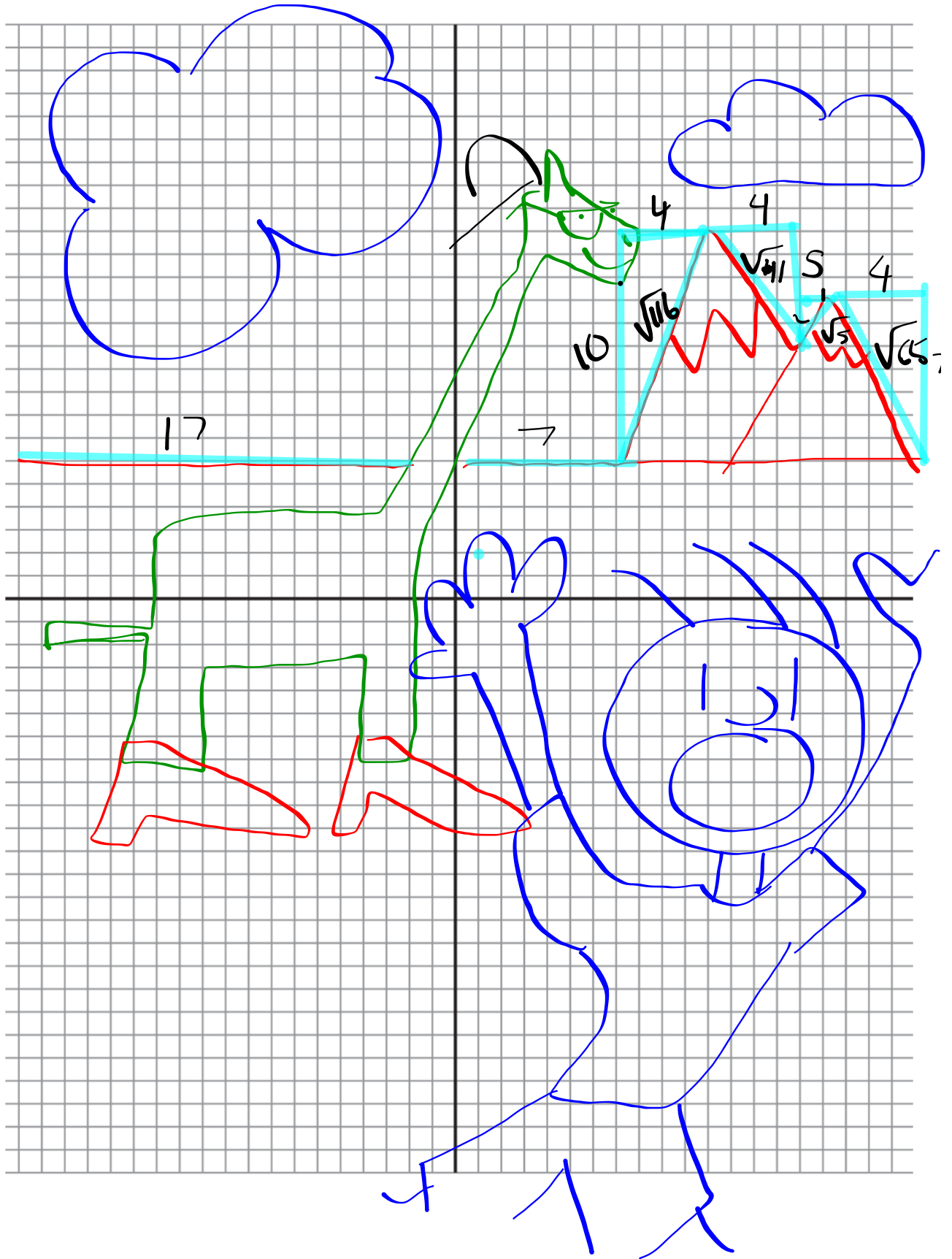
10.

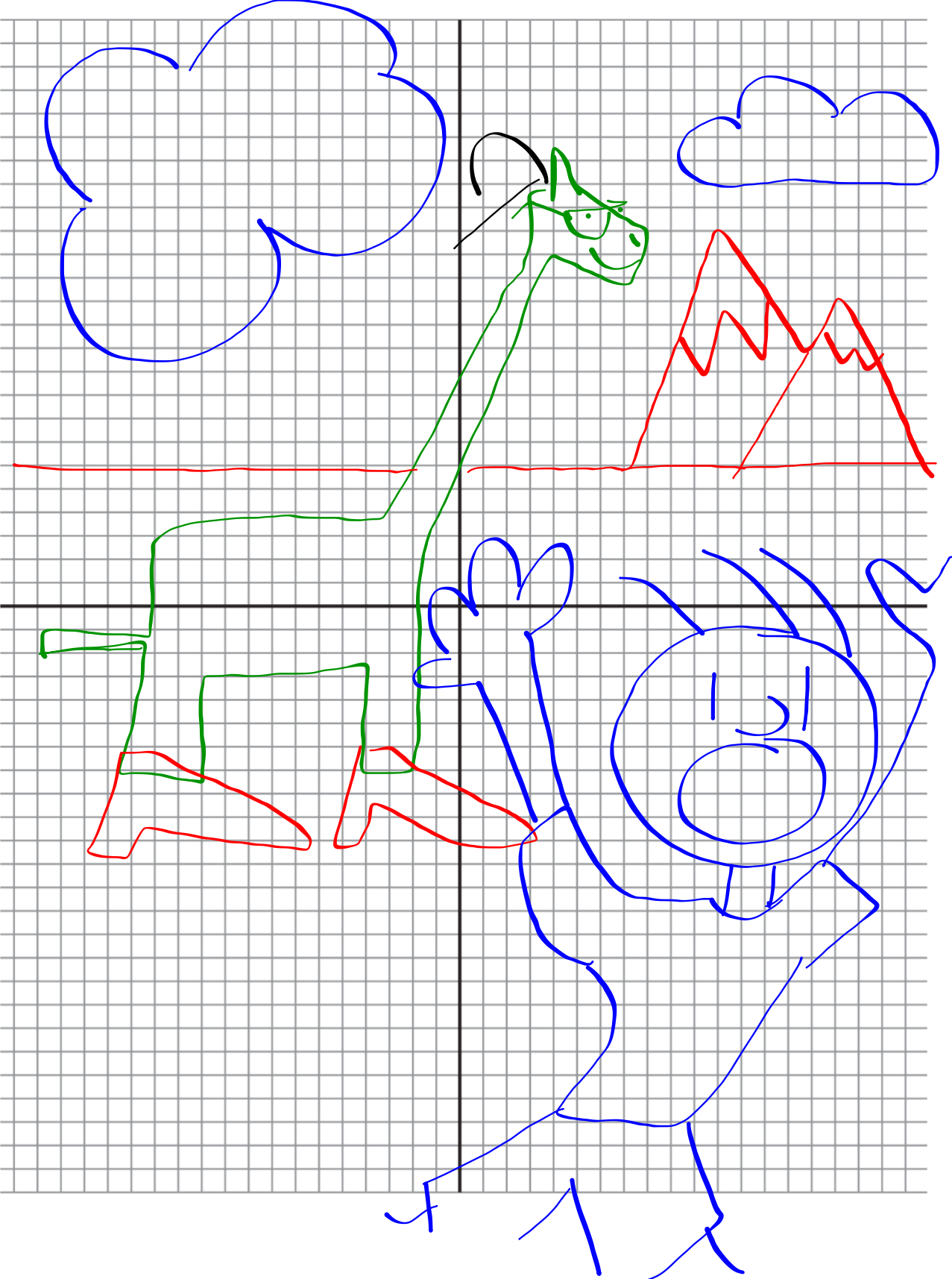




**Directions:** Find the perimeter of the figure using either the distance formula or the Pythagorean Theorem.







## Perimeter

↳ add all sides

↳ Dragonals → Right Triangle

circle's "Belt"

$$C = 2\pi r$$

↑  
circumference