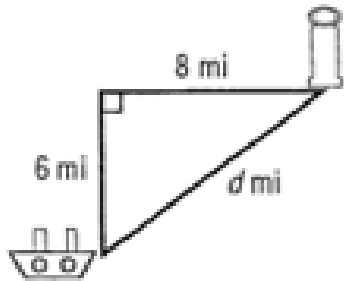


Get out your homework and have it ready to check.

Classwork - Target Check and Distance on a Coordinate Plan

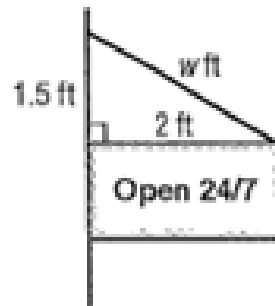
Write an equation that can be used to answer the question. Then solve. Round to the nearest tenth if necessary.

1. How far is the ship from the lighthouse?



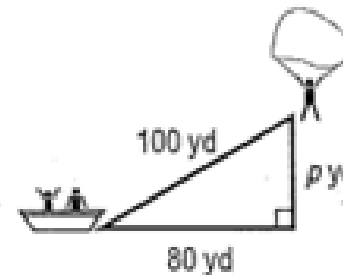
$$\begin{aligned}6^2 + 8^2 &= d^2 \\36 + 64 &= d^2 \\ \sqrt{100} &= \sqrt{d^2} \\10 &= d\end{aligned}$$

2. How long is the wire supporting the sign?



$$\begin{aligned}1.5^2 + 2^2 &= w^2 \\2.25 + 4 &= w^2 \\ \sqrt{6.25} &= \sqrt{w^2} \\2.5 &= w\end{aligned}$$

3. How far above the water is the person parasailing?



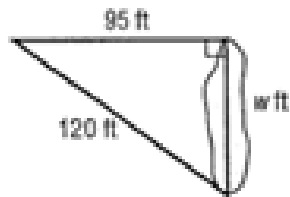
$$\begin{aligned}80^2 + p^2 &= 100^2 \\6400 + p^2 &= 10000 \\-6400 &\quad -6400 \\ \hline \sqrt{p^2} &= \sqrt{3600} \\p &= 60\end{aligned}$$

$d = \underline{10 \text{ mi}}$

$w = \underline{2.5 \text{ ft}}$

$p = \underline{60 \text{ yd}}$

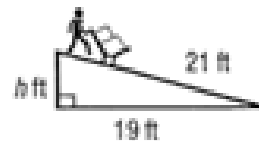
4. How wide is the pond?



$$\begin{aligned}w^2 + 95^2 &= 120^2 \\w^2 + 9025 &= 14400 \\-9025 \quad -9025 & \\ \hline \sqrt{w^2} &= \sqrt{5375} \\w &\approx 73.3\end{aligned}$$

$$w = \underline{73.3 \text{ ft}}$$

5. How high is the ramp?



$$\begin{aligned}h^2 + 19^2 &= 21^2 \\h^2 + 361 &= 441 \\-361 \quad -361 & \\ \hline \sqrt{h^2} &= \sqrt{80} \\h &\approx 8.9\end{aligned}$$

$$h = \underline{8.9 \text{ ft}}$$

6. How high is the end of the ladder against the building?



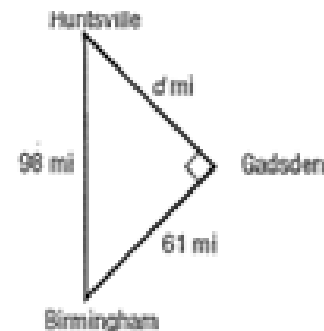
$$\begin{aligned}h^2 + 4^2 &= 13^2 \\h^2 + 16 &= 169 \\-16 \quad -16 & \\ \hline \sqrt{h^2} &= \sqrt{153} \\h &\approx 12.4\end{aligned}$$

$$h = \underline{12.4 \text{ ft}}$$

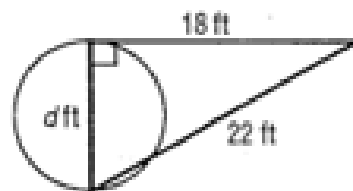
7. GEOGRAPHY Suppose Birmingham, Huntsville, and Gadsden, Alabama, form a right triangle. What is the distance from Huntsville to Gadsden? Round to the nearest tenth if necessary.

$$\begin{aligned}d^2 + 61^2 &= 98^2 \\d^2 + 3721 &= 9604 \\-3721 \quad -3721 & \\ \hline \sqrt{d^2} &= \sqrt{5883}\end{aligned}$$

$$d = \underline{76.7 \text{ mi}} \quad d \approx 76.7$$



8. GEOMETRY Find the diameter d of the circle in the figure at the right. Round to the nearest tenth if necessary.



$$d^2 + 18^2 = 22^2$$

$$d^2 + 324 = 484$$

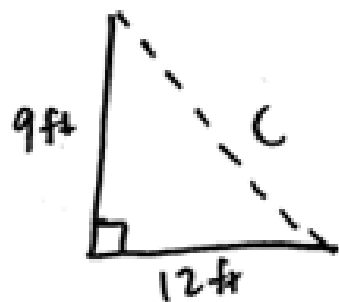
$$\begin{array}{r} - 324 \\ - 324 \\ \hline \end{array}$$

$$\sqrt{d^2} = \sqrt{160}$$

$$d \approx 12.6$$

$$d = \underline{12.6 \text{ ft}}$$

9. Bo is building a tree house. He has marked locations for four holes that will hold its corner posts. They form a figure with a long side of 12 feet and a short side of 9 feet. What must the diagonal of the figure be to make sure the base of his tree house is a rectangle?



$$9^2 + 12^2 = c^2$$

$$\begin{array}{r} 81 + 144 = c^2 \\ \sqrt{225} = \sqrt{c^2} \end{array}$$

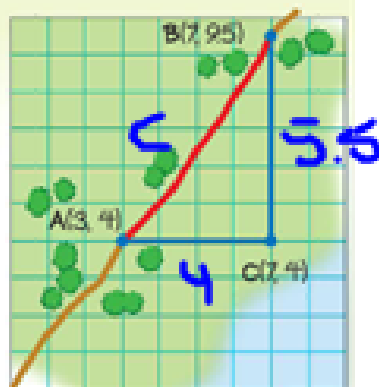
$$15 = c$$

$$\underline{15 \text{ feet}}$$



Real-World Link

Mountain Biking Evan was biking on a trail. A map of the trail is shown. His brother timed his ride from point A to point B .



1. What do the blue and red lines on the graph represent?

Red - The trail he biked

Blue - The legs of a right triangle

2. What type of triangle is formed by the lines?

Right

3. How can you find the length of \overline{AC} and \overline{BC} without counting the number of units?

$$\overline{AC} = 7 - 3 = 4 \text{ units}$$

$$\overline{BC} = 9.5 - 4 = 5.5 \text{ units}$$

4. What are the lengths of the two blue lines?

$$AC = 4 \text{ units}$$

$$BC = 5.5 \text{ units}$$

5. Write an equation using the Pythagorean Theorem that you can use to find the length of \overline{AB} .

p 431

$$5.5^2 + 4^2 = c^2$$

$$30.25 + 16 = c^2$$

$$\sqrt{46.25} = \sqrt{c^2}$$

$$6.8 = c$$

6.8 units

Find Distance on the Coordinate Plane

You can use the Pythagorean Theorem to find the distance between two points on the coordinate plane.

Example



1. Graph the ordered pairs $(3, 0)$ and $(7, -5)$. Then find the distance c between the two points. Round to the nearest tenth.

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

Pythagorean Theorem

$$4^2 + 5^2 = c^2$$

Replace a with 4 and b with 5.

$$41 = c^2$$

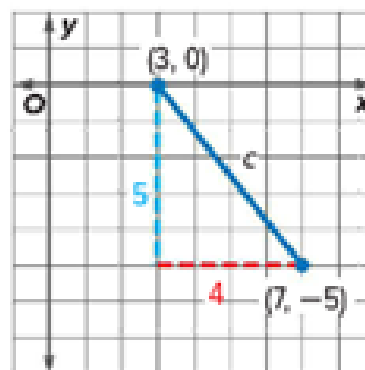
$$4^2 + 5^2 = 16 + 25 \text{ or } 41$$

$$\pm\sqrt{41} = \sqrt{c^2}$$

Definition of square root

$$\pm 6.4 \approx c$$

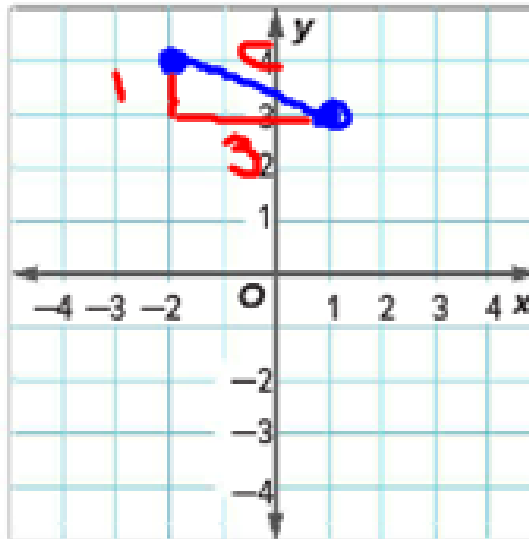
Use a calculator.



The points are about 6.4 units apart.

Got It? Do this problem to find out.

a. $(1, 3), (-2, 4)$



$$1^2 + 3^2 = c^2$$

$$1 + 9 = c^2$$

$$\sqrt{10} = \sqrt{c^2}$$

$$3.2 = c$$

3.2 units

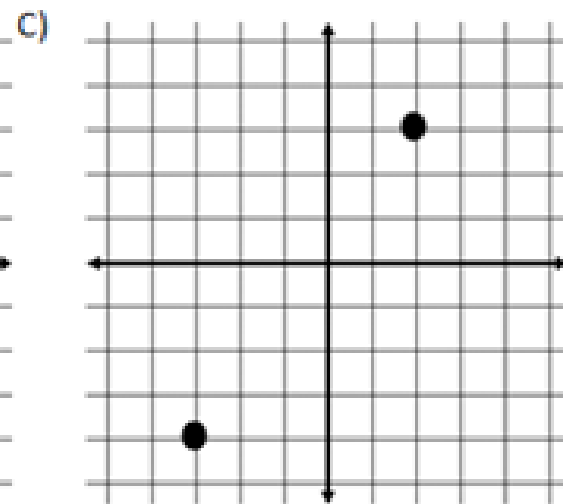
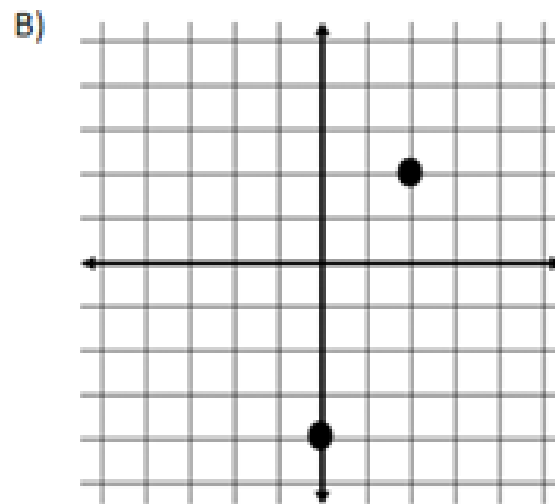
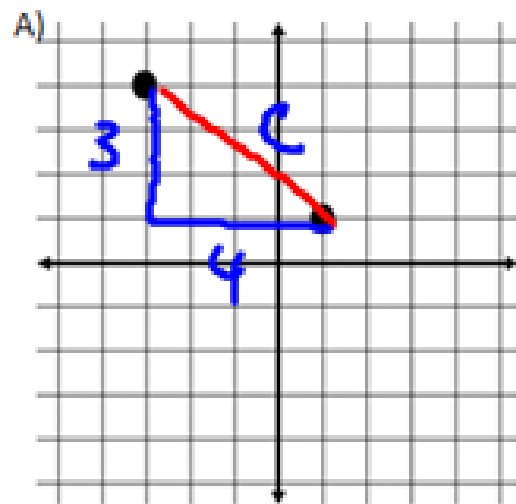
Pythagorean Theorem

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

Distance Formula

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

1) Find the distance between the two given points on the coordinate grid by using the Pythagorean Theorem or the distance formula. Round your answer to the nearest hundredth or leave it in radical form. SHOW WORK.



$$3^2 + 4^2 = c^2$$

$$9 + 16 = c^2$$

$$\sqrt{25} = \sqrt{c^2}$$

$$c = 5 \text{ units}$$