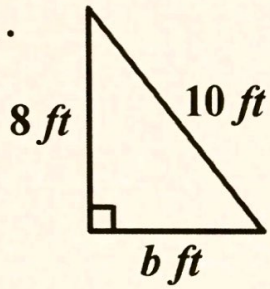
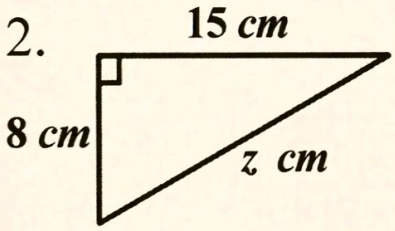
Warm up

Find the length of the missing side of the triangle.

1.

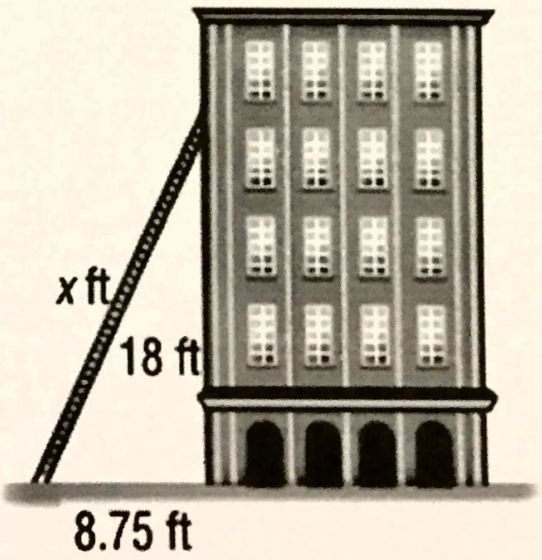


2.



3. $a = 8$ and $b = 15$

Ex. 1: Write an equation that can be used to find the length of the ladder. Then solve. Round to the nearest tenth.



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

$(8.75)^2 + (18)^2 = c^2$

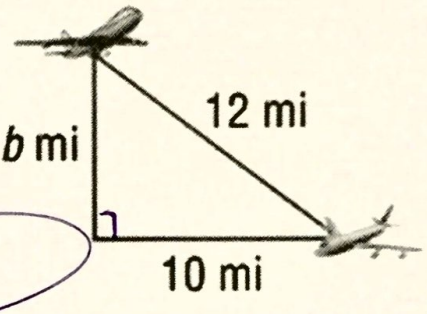
$76.5625 + 324 = c^2$

$\sqrt{400.5625} = \sqrt{c^2}$

$20.01 \text{ ft} = c$

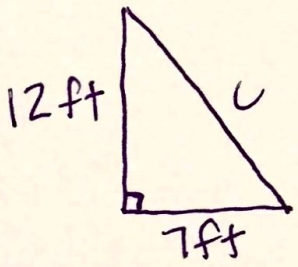
Ex. 2: Write an equation that can be used to find the height of the plane. Then solve. Round to the nearest tenth.

$a^2 + b^2 = c^2$
$10^2 + b^2 = 12^2$
$100 + b^2 = 144$
$-100 \quad -100$
$\sqrt{b^2} = \sqrt{44}$



$b = 2\sqrt{11}$
≈ 6.63 mi

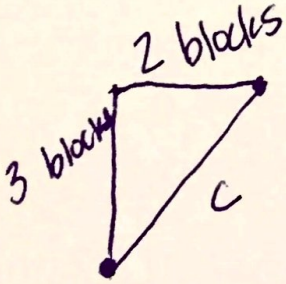
Ex. 3: A 12-foot flagpole is placed in the courtyard of a new hotel. To stabilize the pole, a wire is anchored 7 feet away from the base and stretches to the top of the pole. What is the length of the wire? Round to the nearest tenth.



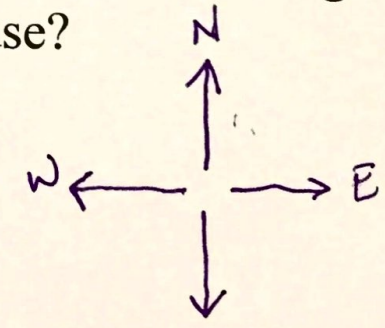
$a^2 + b^2 = c^2$
$12^2 + 7^2 = c^2$
$144 + 49 = c^2$
$\sqrt{193} = \sqrt{c^2}$

$c = 13.9$ ft

Ex. 4: You are going to your friend's house after school. You walk 3 blocks north and then east for 2 blocks. What is the straight line distance from the school to your friend's house?

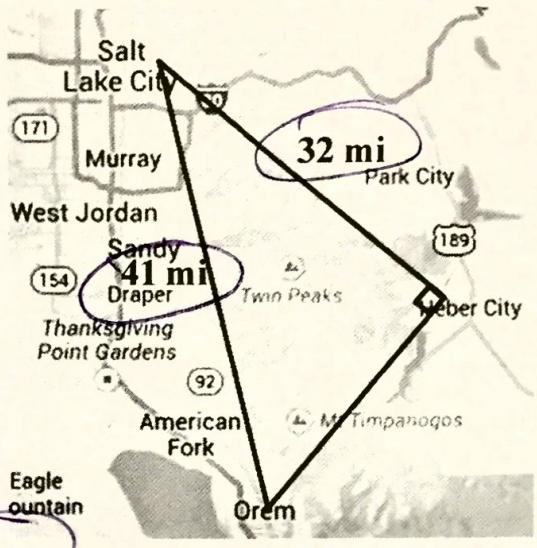


$a^2 + b^2 = c^2$
$3^2 + 2^2 = c^2$
$9 + 4 = c^2$
$\sqrt{13} = \sqrt{c^2}$



$c = 3.61$ blocks

Ex. 5: Suppose Salt Lake City, Heber, and Orem form a right triangle. What is the distance from Orem to Heber?



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

$32^2 + b^2 = 41^2$

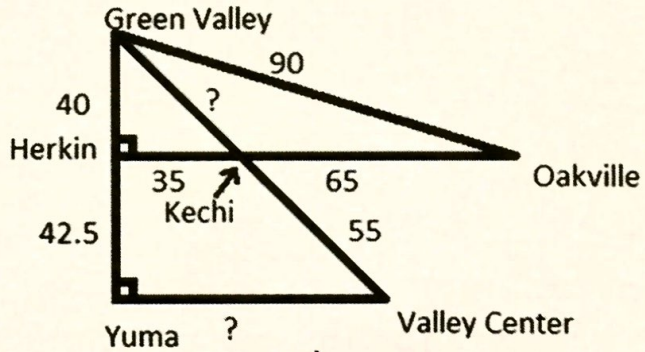
$1024 + b^2 = 1681$

$\sqrt{b^2} = \sqrt{657}$

25.63 mi

Ex. 6: Use the map at the right. Round everything to the nearest tenth. All distances are measured in miles.

a. How far is it from Green Valley to Kechi?



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

$40^2 + 35^2 = c^2$

$1600 + 1225 = c^2$

$2825 = c^2$

$c = \sqrt{2825}$

≈ 53.15 mi

70 mi

b. How much farther is it to go from Green Valley to Yuma to Valley Center than it is to just go straight from Green Valley to Valley Center?

$GV \rightarrow Yuma \rightarrow VC = 40 + 42.5 + 70 = 152.2$

$GV \rightarrow VC = 53.15 + 55 = 108.15$

$152.2 - 108.15 =$ 44.05 mi

Yuma → VC

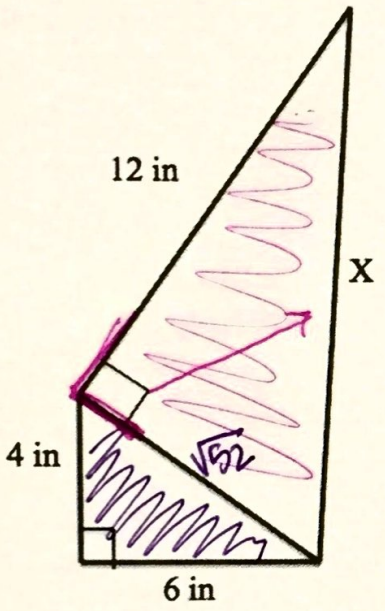
$a^2 + b^2 = c^2$

$82.5^2 + b^2 = 108.15^2$

$\sqrt{b^2} = \sqrt{4890.1725}$

$b = 70$ mi

Ex. 7: The right triangles are connected where the hypotenuse of one triangle is a leg of a different triangle. Find the length of the side X



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

$6^2+4^2=c^2$

$36+16=c^2$

$\sqrt{52}=\sqrt{c^2}$

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

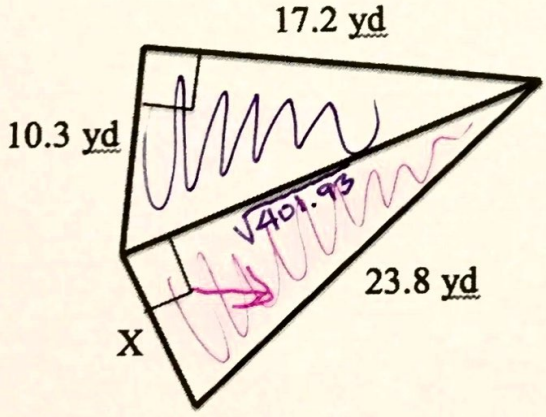
$12^2+(\sqrt{52})^2=c^2$

$144+52=c^2$

$\sqrt{196}=\sqrt{c^2}$

$14\text{ in}=c$

Ex. 8: The right triangles are connected where the hypotenuse of one triangle is a leg of a different triangle. Find the length of the side X, round to the nearest tenth



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

$(10.3)^2+(17.2)^2=c^2$

$106.09+295.84=c^2$

$\sqrt{401.93}=\sqrt{c^2}$

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

$a^2+(\sqrt{401.93})^2=(23.8)^2$

$a^2+401.93=566.44$

$-401.93 \quad -401.93$

$\sqrt{a^2}=\sqrt{164.51}$

$a=12.8\text{ yd}$