The Pythagorean relationship can be used to determine distances that might be - ___difficult___ or ___impossible___ to measure.
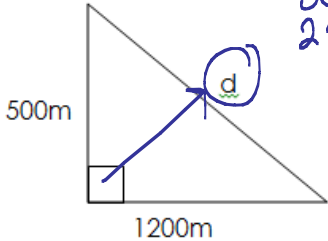
$a^2 + b^2 = c^2$
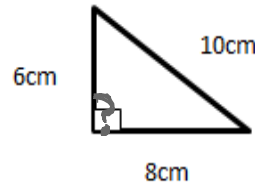$500^2 + 1200^2 = d^2$
$250000 + 1440000 = d^2$
$1690000 = d^2$
$1300m = d$

500m
1200m
d

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The Pythagorean theorem can be used to determine if the triangle is a ___right___ triangle.
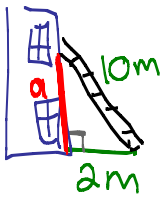
10cm
6cm
8cm

$a^2 + b^2 = c^2$
$6^2 + 8^2 = 10^2$
$36 + 64 = 100$
$100 = 100$
yes.

---

Brad places a 10m ladder up against a building so that it reaches the second floor window. The base of the ladder is 2m from the base of the house. How high is the second floor window?

10m
a
2m

$a^2 + b^2 = c^2$
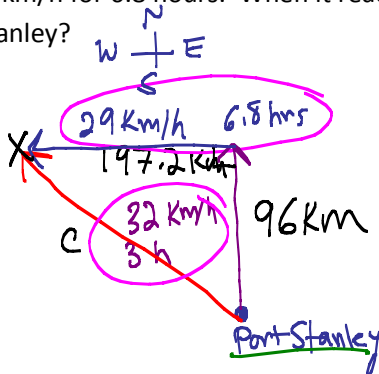$a^2 + 2^2 = 10^2$
$a^2 + 4 = 100$
$-4 \quad -4$
$\sqrt{a^2} = \sqrt{96}$
$a = 9.8m$

The second floor window is 9.8m high.

---

A cruise ship travels from Port Stanley north at a speed of 32km/H for 3 hours. Then it turns 90° and travels west at 29km/h for 6.8 hours. When it reaches its final destination at that time, how far is the ship from where it started at Port Stanley?

W — E
N S
29Km/h 6.8hrs
197.2km
32 km/h 96Km
3h
C
Port Stanley

$a^2 + b^2 = c^2$
$197.2^2 + 96^2 = c^2$
$38887.84 + 830,584 = c^2$
$\sqrt{869471.84} = \sqrt{c^2}$
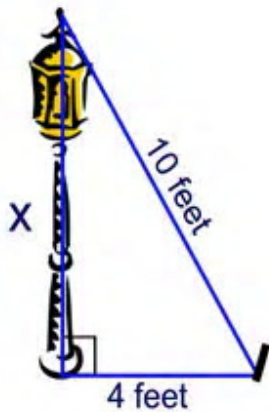$932.5km = c$

$32 km/h \times 3h$
$= 96 Km$
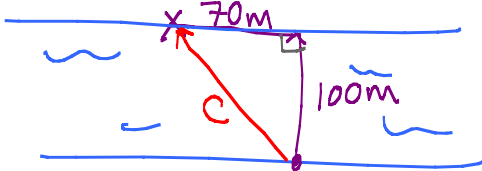
$29 km/h \times 6.8h$
$197.2 Km$

The Ship is 932.5km away

Using the picture below, determine the height of the lamp pole.



$$a^2 + b^2 = c^2$$
$$x^2 + 4^2 = 10^2$$
$$x^2 + 16 = 100$$
$$\phantom{x^2} -16 \quad\quad -16$$
$$\sqrt{x^2} = \sqrt{84}$$
$$x = 9.17 \text{ feet}$$

The lamp is 9.17 feet tall.

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Brooke wants to swim across a river that is 100m wide.  As she begins to swim the current carries her 70m downstream.
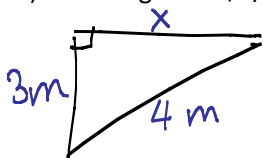How far did she actually swim?



$$a^2 + b^2 = c^2$$
$$70^2 + 100^2 = c^2$$
$$4900 + 10000 = c^2$$
$$\sqrt{14900} = \sqrt{c^2}$$
$$122.1 m = c$$

She swims 122.1m.

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Frances wants to put a fence around her vegetable garden to keep out the rabbits.  Her garden is in the shape of a right triangle.

a)  If the hypotenuse is 4m and one side is 3m, what it the total length of fence she'll need?

b) If fencing costs $3/m, how much will it cost in total?



a)
$$a^2 + b^2 = c^2$$
$$x^2 + 3^2 = 4^2$$
$$x^2 + 9 = 16$$
$$\phantom{x^2} -9 \quad -9$$
$$\sqrt{x^2} = \sqrt{7}$$
$$x = 2.65 m$$

Total fence $= 2.65m + 4m + 3m$
$$= 9.646 m$$

b) $9.646 m \times \$3/m$
$$= \$28.94$$