

Occupied Restroom...

① $15^2 + 24^2 = c^2$
 $225 + 576 = c^2$
 $\sqrt{801} = \sqrt{c^2}$
 $28.3 \text{ cm} = c$

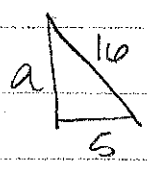
② $27^2 + b^2 = 30^2$
 $729 + b^2 = 900$
 $\sqrt{b^2} = \sqrt{171}$
 $b = 13.1 \text{ ft}$

③ $a^2 + .6^2 = .8^2$
 $a^2 + .36 = .64$
 $\sqrt{a^2} = \sqrt{.28}$
 $a = .5 \text{ km}$

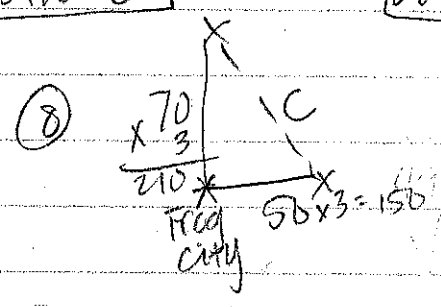
④ not possible

⑤ $52^2 + 29^2 = c^2$
 $2704 + 841 = c^2$
 $\sqrt{3545} = \sqrt{c^2}$
 $59.5 \text{ in} = c$

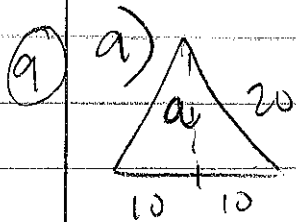
⑥ $a^2 + 5^2 = 10^2$
 $a^2 + 25 = 256$
 $\sqrt{a^2} = \sqrt{231}$
 $a = 15.2 \text{ ft}$



⑦ $a^2 + 15^2 = 25^2$
 $a^2 + 225 = 625$
 $\sqrt{a^2} = \sqrt{400}$
 $a = 20 \text{ ft}$



$210^2 + 150^2 = c^2$
 $44100 + 22500 = c^2$
 $\sqrt{66600} = \sqrt{c^2}$
 $258.1 \text{ mi} = c$



$$a^2 + 10^2 = 20^2$$

$$a^2 + 100 = 400$$

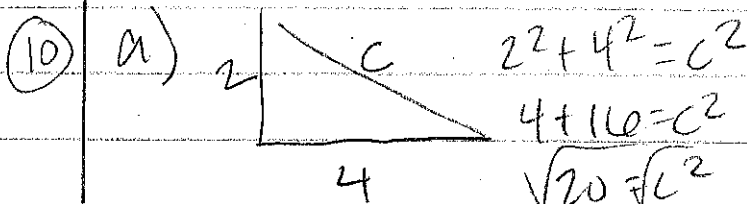
$$\sqrt{a^2} = \sqrt{300}$$

$$a = 17.3 \text{ cm}$$

b) $A = \frac{bh}{2} =$

$$A = \frac{20(17.3)}{2} =$$

$$A = 173 \text{ cm}$$



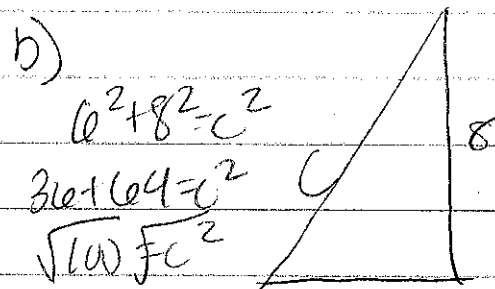
$$2^2 + 4^2 = c^2$$

$$4 + 16 = c^2$$

$$\sqrt{20} = \sqrt{c^2}$$

$$4.5 = c$$

$$2 + 4 + 4.5 = 10.5 \text{ cm}$$



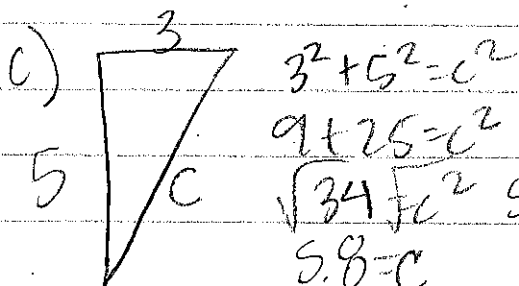
$$6^2 + 8^2 = c^2$$

$$36 + 64 = c^2$$

$$\sqrt{100} = \sqrt{c^2}$$

$$10 = c$$

$$6 + 8 + 10 = 24 \text{ cm}$$



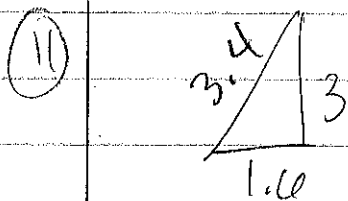
$$3^2 + 5^2 = c^2$$

$$9 + 25 = c^2$$

$$\sqrt{34} = \sqrt{c^2}$$

$$5.8 = c$$

$$5.8 + 5 + 3 = 13.8 \text{ cm}$$



$$1.0^2 + 3^2 = c^2$$

$$2.56 + 9 = c^2$$

$$\sqrt{11.56} = \sqrt{c^2}$$

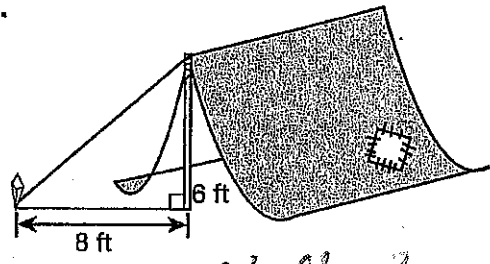
$$3.4 = c$$

$$\begin{array}{r} 1.0 \\ + 3.0 \\ \hline 4.0 \end{array}$$

$$4.0 - 3.4 = 0.6 \text{ km shorter}$$

Use the Pythagorean theorem to solve each problem.

A tent is supported by a guy rope tied to a stake, as shown in the diagram. What is the length of the rope? 10 ft

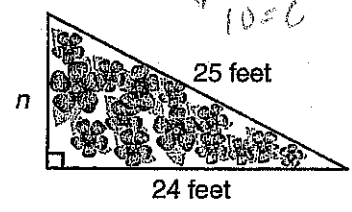


$c^2 + 8^2 = c^2$
 $36 + 64 = c^2$
 $\sqrt{100} = c$
 $10 = c$

If the supporting stake in Problem 1 were 15 feet from the tent, and an 8-foot tent pole were used, what would be the length of the guy rope? 17 ft

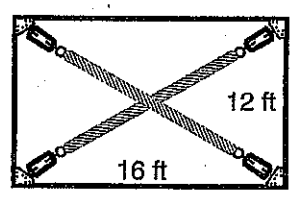
$8^2 + 15^2 = c^2$
 $64 + 225 = c^2$
 $289 = c^2$
 $c = 17$

Stephanie is planning a right triangular garden. She marked two sides that measure 24 feet and 25 feet. What is the length of side n ? 7 ft



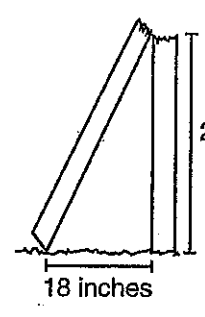
$n^2 + 24^2 = 25^2$
 $n^2 + 576 = 625$
 $n^2 = 49$
 $n = 7$

A builder needs to add diagonal braces to a wall. The wall is 16 feet wide by 12 feet high. What is the length of each brace? 20 ft each



$16^2 + 12^2 = c^2$
 $256 + 144 = c^2$
 $400 = c^2$
 $c = 20$

The diagram at the right shows how a post was broken. What was the original height of the post? 18.1 in



$2^2 + 18^2 = c^2$
 $4 + 324 = c^2$
 $328 = c^2$
 $18.1 = c$

The sets of numbers 3, 4, 5 and 5, 12, 13 are examples of Pythagorean triples. Use what you know about the Pythagorean theorem to explain why these numbers are called Pythagorean triples. If you square a, square b, then add them, you get the square of c.

Determine whether the following sets of three numbers are Pythagorean triples. Write yes or no for each set of numbers.

- 8, 15, 17 yes
- 15, 20, 25 yes
- 10, 48, 52 yes
- 2, 9, 11 no
- 39, 80, 89 yes

$64 + 225 = 289$ ✓
 $225 + 400 = 625$ ✓
 $400 + 2304 = 2704$ ✓
 $4 + 81 = 85$ X
 $1521 + 6400 = 7921$ ✓

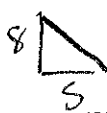
Name: _____
 Math 8A, Period _____

KJH
 Date: _____

Pythagorean Theorem Word Problems #1

Word Problems. Draw a picture first, then use the Pythagorean Theorem to solve.

1. A wire is stretched from the top of an 8-ft pole to a bracket 5 ft. from the base of the pole. How long is the wire?



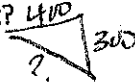
$$8^2 + 5^2 = c^2$$

$$64 + 25 = c^2$$

$$\sqrt{89} = c$$

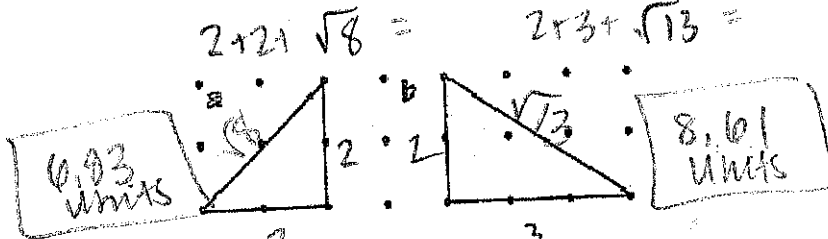
$$c \approx 9.4 \text{ ft}$$

2. A helicopter rose vertically 300 m and then flew west 400 m. How far was the helicopter from its starting point?



$$c = 500 \text{ m (triple)}$$

3. The triangles below are drawn on 1-cm dot paper. Find the perimeter of each triangle.



$$2 + 2 + \sqrt{8} = \quad 2 + 3 + \sqrt{13} =$$

$$6.93 \text{ units}$$

$$8.61 \text{ units}$$

4. A park is in the shape of a rectangle 8 miles long and 6 miles wide. How much shorter is your walk if you walk diagonally across the park than along two sides of it?



$$6^2 + 8^2 = c^2$$

$$36 + 64 = c^2$$

$$\sqrt{100} = c$$

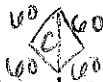
$$c = 10$$

$$6 + 8 = 14$$

$$14 - 10 = 4 \text{ mi shorter}$$

$$4 \text{ mi shorter}$$

5. The bases on a softball diamond are 60 feet apart. How far is it from home plate to second base?



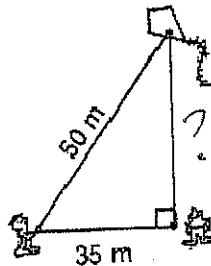
$$60^2 + 60^2 = c^2$$

$$\sqrt{7200} = c$$

$$c \approx 84.85 \text{ ft}$$

$$c \approx 84.85 \text{ ft}$$

6. Anna has let out 50 meters of kite string when she observes that her kite is directly above Emily. If Anna is 35 meters from Emily, how high is the kite?



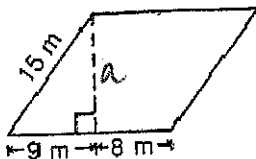
$$a^2 + 35^2 = 50^2$$

$$a^2 + 1225 = 2500$$

$$\sqrt{a^2} = \sqrt{1275}$$

$$a \approx 35.71 \text{ m}$$

7. What is the height of the parallelogram?



$$a^2 + 9^2 = 15^2$$

$$a^2 + 81 = 225$$

$$\sqrt{a^2} = \sqrt{144}$$

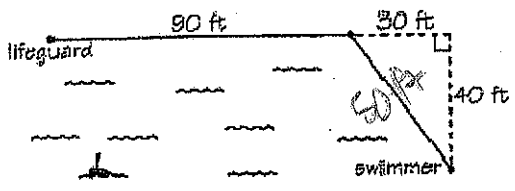
$$a = 12 \text{ m}$$

8. What is the area of the parallelogram in question 7?

$$A = bh \quad A = 17(12) = \boxed{204 \text{ m}^2}$$

9. A lifeguard spots a drowning swimmer 40 ft. from the beach. She runs 90 ft. along the beach at a speed of 15 feet per second, then jumps in the water and swims straight to the swimmer at a speed of 5 feet per second. How long does it take her to reach the swimmer?

*
 $d = vt$
 $r = \frac{d}{t}$

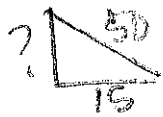


$$\frac{90}{15} = 6$$

$$\frac{50}{5} = 10$$

$$6 + 10 = \boxed{16 \text{ seconds}}$$

10. A 50-ft. cable is stretched from the top of an antenna to an anchor point on the ground 15 ft. from the base of the antenna. How tall is the antenna?



$$a^2 + 15^2 = 50^2$$

$$a^2 + 225 = 2500$$

$$\sqrt{a^2} = \sqrt{2275}$$

$$a \approx \boxed{47.7 \text{ ft}}$$

11. These triangles are drawn on 1-cm dot paper. Find the perimeter of each one.

$$1 + 16 = c^2$$

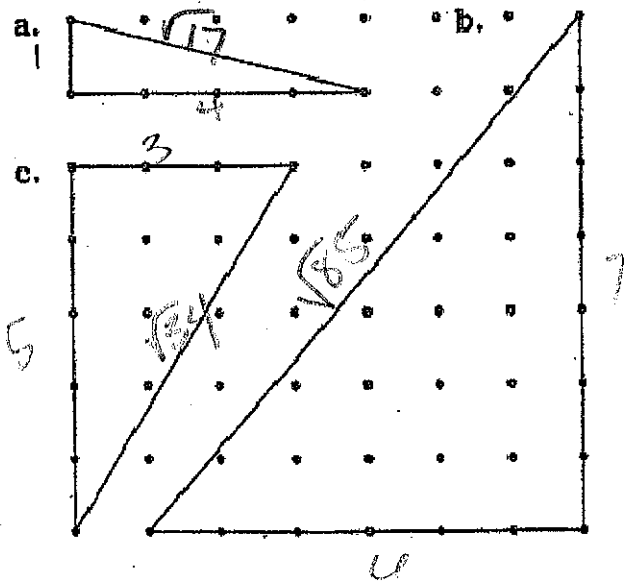
$$\sqrt{17} = c$$

$$P = c$$

$$9 + 25 = c^2$$

$$\sqrt{34} = c$$

$$P = c$$



$$36 + 49 = c^2$$

$$\sqrt{85} = c$$

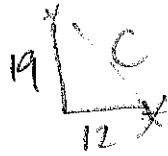
$$P = c$$

$$a) P = 9.12 \text{ UNITS}$$

$$b) P = 22.22 \text{ UNITS}$$

$$c) P = 13.83 \text{ UNITS}$$

12. A ship leaves port and sails 12 kilometers west then 19 kilometers north. How far is the ship from the port?



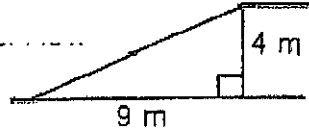
$$12^2 + 19^2 = C^2$$

$$144 + 361 = C^2$$

$$\sqrt{505} \text{ km}$$

$$C \approx 22.5 \text{ km}$$

13. An inclined ramp rises 4 meters over a horizontal distance of 9 meters. How long is the ramp?

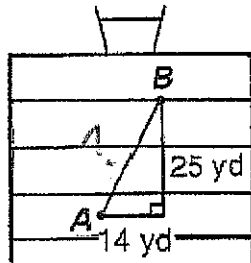


$$9^2 + 4^2 = C^2$$

$$\sqrt{97} \text{ m}$$

$$C \approx 9.85 \text{ m}$$

14. A quarterback at point A throws the football to a receiver who catches it at point B. How long was the pass?



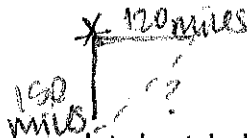
$$25^2 + 14^2 = C^2$$

$$625 + 196 = C^2$$

$$\sqrt{821} \text{ ft}$$

$$C \approx 28.65 \text{ yd}$$

15. Two trains left Metropolis at the same time. One traveled south at 50 mph. The other traveled east at 40 mph. How far apart were the trains at the end of 3 hours?



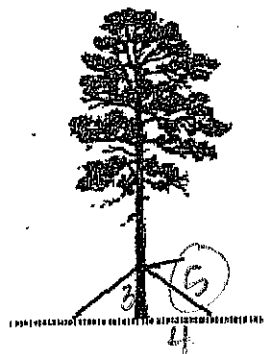
$$120^2 + 150^2 = C^2$$

$$14400 + 22500 = C^2$$

$$\sqrt{36900} \text{ ft}$$

$$C = 192.1 \text{ miles apart}$$

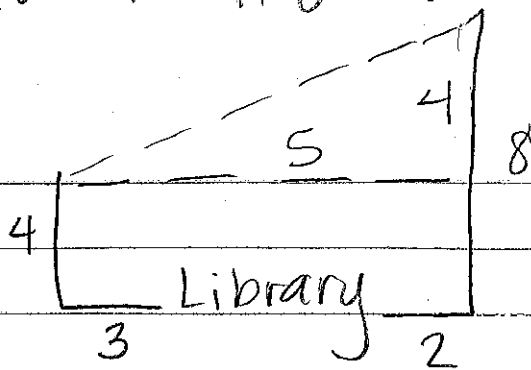
16. A newly-planted tree needs to be staked with three wires. Each wire is attached to the trunk 3 ft. above the ground, and then anchored to the ground 4 ft. from the base of the tree. How much wire is needed for 6 trees?



$$5 \times 3 = 15 \times 6 = 90 \text{ ft. of wire}$$

10-1 #8

①



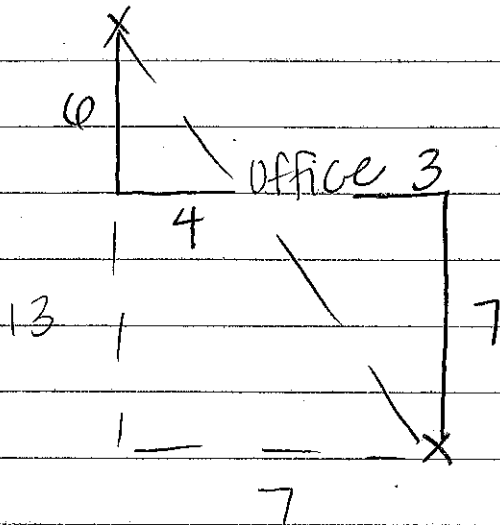
$$4^2 + 5^2 = c^2$$

$$16 + 25 = c^2$$

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

$\sqrt{41}$ or 6.4 blocks apart.

②



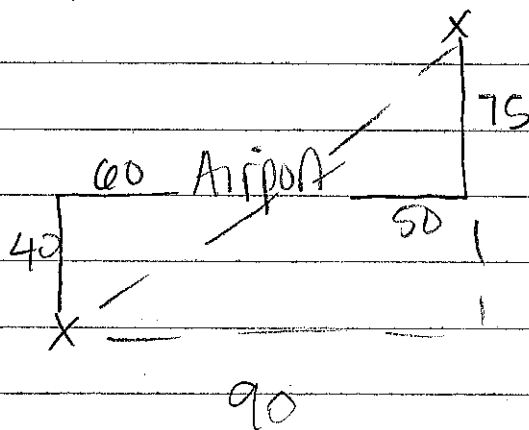
$$13^2 + 7^2 = c^2$$

$$169 + 49 = c^2$$

$$\sqrt{218} = \sqrt{c^2}$$

$\sqrt{218}$ or 14.8 mi apart.

③



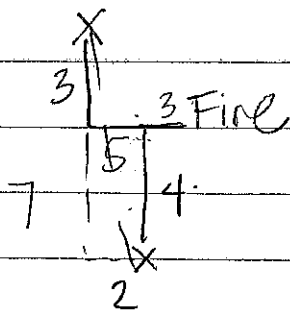
$$110^2 + 115^2 = c^2$$

$$12100 + 13225 = c^2$$

$$\sqrt{25325} = \sqrt{c^2}$$

$\sqrt{25325}$ or about 159.1 mi apart.

④



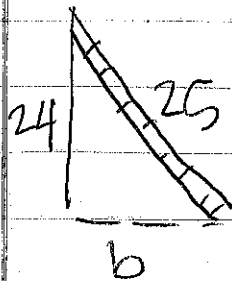
$$7^2 + 2^2 = c^2$$

$$49 + 4 = c^2$$

$$\sqrt{53} = \sqrt{c^2}$$

$\sqrt{53}$ or 7.3 km apart.

5



$$24^2 + b^2 = 25^2$$

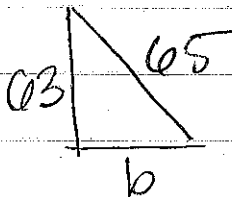
$$576 + b^2 = 625$$

$$\sqrt{b^2} = \sqrt{49}$$

$$b = 7$$

Should be 7 ft from the building.

6



$$63^2 + b^2 = 65^2$$

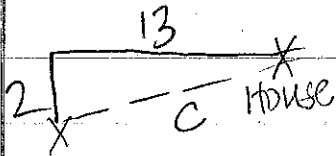
$$3969 + b^2 = 4225$$

$$\sqrt{b^2} = \sqrt{256}$$

$$b = 16$$

3rd side should be 16 ft.

7



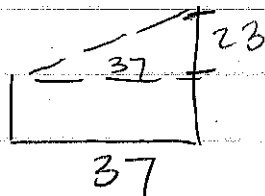
$$13^2 + 3^2 = c^2$$

$$169 + 9 = c^2$$

$$\sqrt{178} \text{ ft}^2$$

$$\sqrt{178} \text{ or } 13.3 \text{ mi.}$$

8



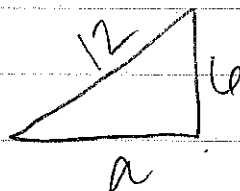
$$37^2 + 23^2 = c^2$$

$$1369 + 529 = c^2$$

$$\sqrt{1898} \text{ ft}^2$$

$$\sqrt{1898} \text{ or } 43.6 \text{ ft}$$

9



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

$$a^2 + 36 = 144$$

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

$$a = \sqrt{108} \text{ or } 10.4 \text{ ft}$$