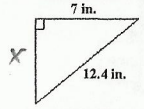
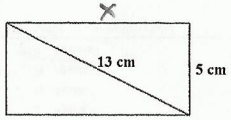
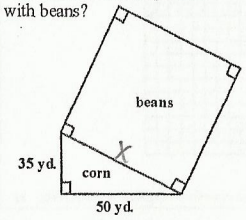
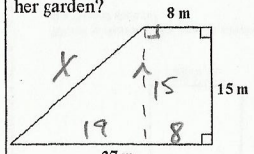
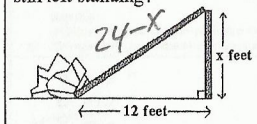
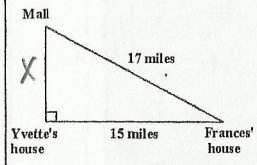
Pythagorean Theorem Extensions Name KEY

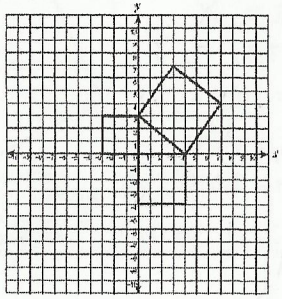
Often on tests you will be asked to use the Pythagorean Theorem as a step to solve a problem. Be careful – the answer you get for one of your sides of a right triangle (a, b, or c) is *not always the final answer to the problem!*

In the problems that follow, read the question, write (in words) what you will do to find the answer, show your work, and then answer the problem.

Problem Situation	Written description of problem solving process and work	Answer(s)
1. Jimmy wants to make a metal bracket to hold up a display shelf. He draws a diagram of the bracket, which is shown below. Find the perimeter of the bracket (i.e. the length of metal Jimmy will need to buy). Round your answer to the nearest tenth of an inch. 	Use pyth. theorem to find missing leg. $7^2 + x^2 = 12.4^2$ $49 + x^2 = 153.76$ $x^2 = 104.76$ $x = 10.2$	Missing side of the right triangle: 10.2 in. Final answer to the question being asked: 29.6 in.
2. What is the area of the rectangle shown below? 	Use P.T. to find the rectangle's length. $13^2 = 5^2 + x^2$ $169 = 25 + x^2$ $x^2 = 144$ $x = 12$	Missing side of the right triangle: 12 cm Final answer to the question being asked: 60 cm²
3. A farmer has planted the piece of land shown below with corn and beans. What is the area of the square section planted with beans? 	① Use P.T. to find the hypotenuse. ② Square the length of the hypotenuse. $35^2 + 50^2 = x^2$ $x^2 = 1225 + 2500$ $x^2 = 3725$ $x \approx 61.03$	Missing side of the right triangle: 61 yds. Final answer to the question being asked: 3,725 yds²

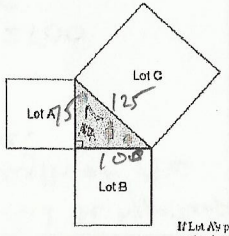
Problem Situation	Written description of problem solving process and work	Answer(s)
4. Jessica has a garden in the shape shown below. What is the approximate perimeter of her garden? 	① make a right △ by drawing a segment ∥ to the 15 m. side. ② Use P.T. to find missing side. $15^2 + 19^2 = x^2$ $x^2 = 586$ $x \approx 24.2$	Missing side of the right triangle: 24.2 Final answer to the question being asked: 74.2
5. A 24-foot tall tree was hit by lightning during a storm, cracked, and fell over. After it broke, the top of the tree touched the ground 12 feet from the base of the tree. How tall is the part of the tree still left standing? 	Use P.T. to find leg of rt. △. $x^2 + 12^2 = (24-x)^2$ $x^2 + 144 = 576 - 48x + x^2$ $144 = 576 - 48x$ $-48x = -432$ $x = 9$	Missing sides of the right triangle: 9 Final answer to the question being asked: 9
6. The map below shows two different routes that Frances takes the mall – one when she picks up her friend Yvette first, and one when she goes straight to the mall. How many miles does Frances save when she goes directly to the mall? 	① Use P.T. to find x. ② Calculate length of each route ③ Find the difference b/t the routes. $x^2 + 15^2 = 17^2$ $x = 8$ $8 + 15 = 23$ Direct route: 17 $23 - 17 = 6$	Missing side of the right triangle: 8 Final answer to the question being asked: 6

14 What is the area of the largest square in the diagram?



F 6 units²
G 9 units²
H 16 units²
J 25 units²

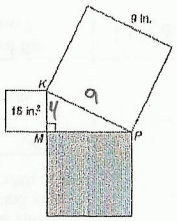
33 The drawing below shows 3 square parking lots that enclose a grassy area shaped like a right triangle.



If Lot A's perimeter is 300 yards and Lot B's perimeter is 400 yards, what is the perimeter of Lot C?

A 600 yd
B 700 yd
C 1400 yd
D 2000 yd

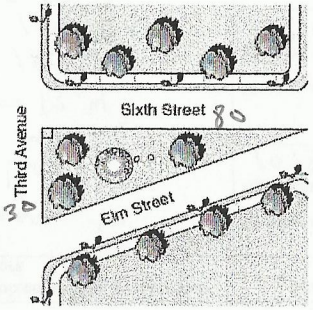
28 Look at the drawing shown below.



If $\triangle KMP$ is a right triangle formed by the placement of 3 squares, what is the area of the shaded square?

A 135 in.²
B 24 in.²
C 56 in.²
D 81 in.²

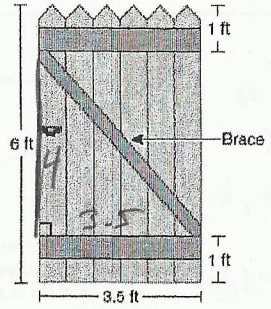
38 In a town, there is a small garden shaped like a triangle, as shown below. The side of the garden that faces Sixth Street is 80 feet in length. The side of the garden that faces Third Avenue is 30 feet in length.



What is the approximate length of the side of the garden that faces Elm Street?

F 35 ft
G 40 ft
H 85 ft
J 110 ft

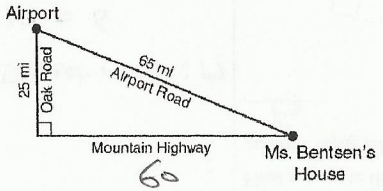
35 Mr. Carpenter built a wooden gate, as shown below.



Which is closest to the length in feet of the diagonal board that Mr. Carpenter used to brace the wooden gate?

A 4.9 ft
B 5.3 ft
C 6.1 ft
D 6.9 ft

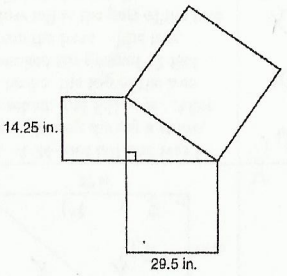
25 The map below shows 2 different routes Ms. Bentsen can take to drive to the airport from her house.



How many miles could Ms. Bentsen save by traveling on Airport Road instead of Mountain Highway and Oak Road to get to the airport?

A 20 mi
B 30 mi
C 35 mi
D 60 mi

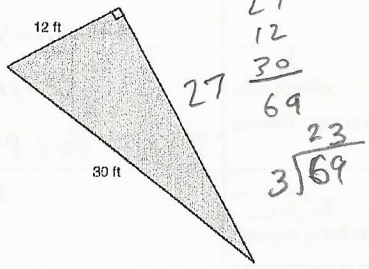
15 The drawing below shows how 3 squares can be joined at their vertices to form a right triangle.



Which is closest to the area in square inches of the largest square?

A 1914 in.²
B 238 in.²
C 210 in.²
D 1073 in.²

16 Mrs. Cheung hired a landscaping service to plant a row of bushes around her triangular backyard.



If the bushes must be planted 3 feet apart, approximately how many bushes are needed for Mrs. Cheung's backyard?

A 23
B 25
C 28
D 32