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### U15 HWK #4 *Applications of the Pythagorean Theorem*

**Directions:** For each problem, **first draw a picture** if one is not provided and then solve the problem.

1. What is the length of the diagonal of a square with a side length of 4 cm?
2. One side length of a rectangle is 2 in. The diagonal of the rectangle has a length of $2\sqrt{5}$ inches. What is the length of the other side of the rectangle?
3. You are locked out of your house. You can see that there is a window on the second floor that is open so you plan to go and ask your neighbor for a ladder long enough to reach the window. The window is 20 feet off the ground. There is a vegetable garden on the ground below the window that extends 10 ft. from the side of the house that you can’t put the ladder in. What size ladder should you ask your neighbor for?
4. A rectangular-shaped room has a width of 12 feet, a length of 20 feet, and a height of 8 feet. What is the approximate distance from one corner on the floor (Point A in the figure) to the opposite corner on the ceiling (Point B in the figure)?



1. The following is a scale drawing of a patio that Mr. Davis plans to build in his backyard. Each box in the scale drawing represents 1 unit.



1. Find the exact value of the perimeter of the scale drawing of the patio. Show all work and thinking.
2. Find the area of the scale drawing of the patio. Show all work and thinking.

**Higher Level Thinking Required!!** Square *ABCD* has side lengths equal to 4 inches. Connecting the midpoints of each side forms the next square inside *ABCD*. This pattern of connecting the midpoints to form a new square is repeated. Show your thinking as you work.



1. What is the side length of the inner-most square?
2. What is the area of the inner-most square?
3. What is the ratio of the area of each square to the area of the next square created?