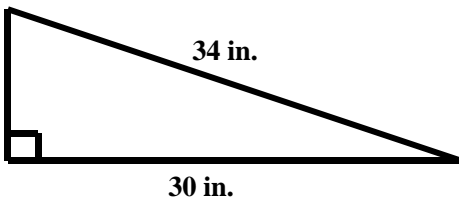


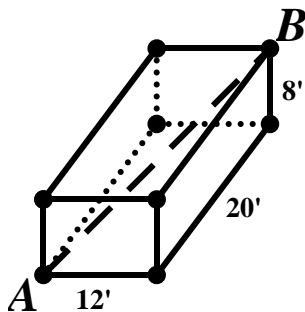
10.3a Homework: Applications of the Pythagorean Theorem

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 inches. 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. A football field is 360 feet long and 160 feet wide. What is the length of the diagonal of a football field assuming the field is in the shape of a rectangle?
4. The length of an Olympic-size swimming pool is 55 meters. The width of the pool is 25 meters. What is the length of the diagonal of the pool assuming the pool is in the shape of a rectangle?
5. 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?

6. Kanye just purchased a skateboarding ramp. The ramp is 34 inches long and the length of the base of the ramp is 30 inches as shown below. What is the height of the ramp?

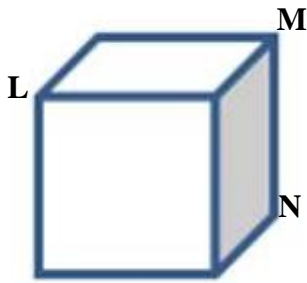


7. A rectangular-shaped room has a width of 12 feet, a length of 20 feet, and a height of 8 feet. What is the approximate distance from one corner on the floor (Point A in the figure) to the opposite corner on the ceiling (Point B in the figure)?



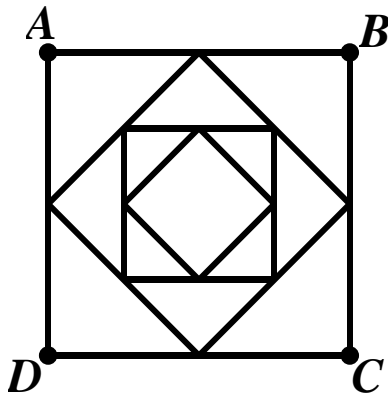
8. A large pile of sand has been dumped into a conical pile in a warehouse. The slant height of the pile is 20 feet. The diameter of the base of the sand pile is 32 ft. Find the volume of the pile of sand.

9. The cube below is a unit cube. A unit cube is a cube of side length 1.



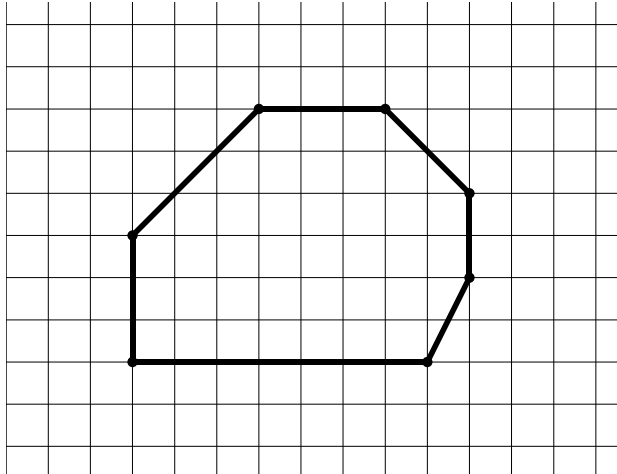
- a. What is the length of \overline{LM} ? Leave your answer in simplest radical form.
- b. What is the length of \overline{LN} ? Leave your answer in simplest radical form.

Extra for Experts: 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.



- a. What is the side length of the inner-most square?
- b. What is the area of the inner-most square?
- c. What is the ratio of the area of each square to the area of the next square created?

Extra for Experts: 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.



- Find the exact value of the perimeter of the scale drawing of the patio. Show all work and thinking.
- Find the area of the scale drawing of the patio. Show all work and thinking.
- If the scale on the drawing above is 1 unit = 3 feet, what is the actual measure of the perimeter of the patio? The area? Show all work.