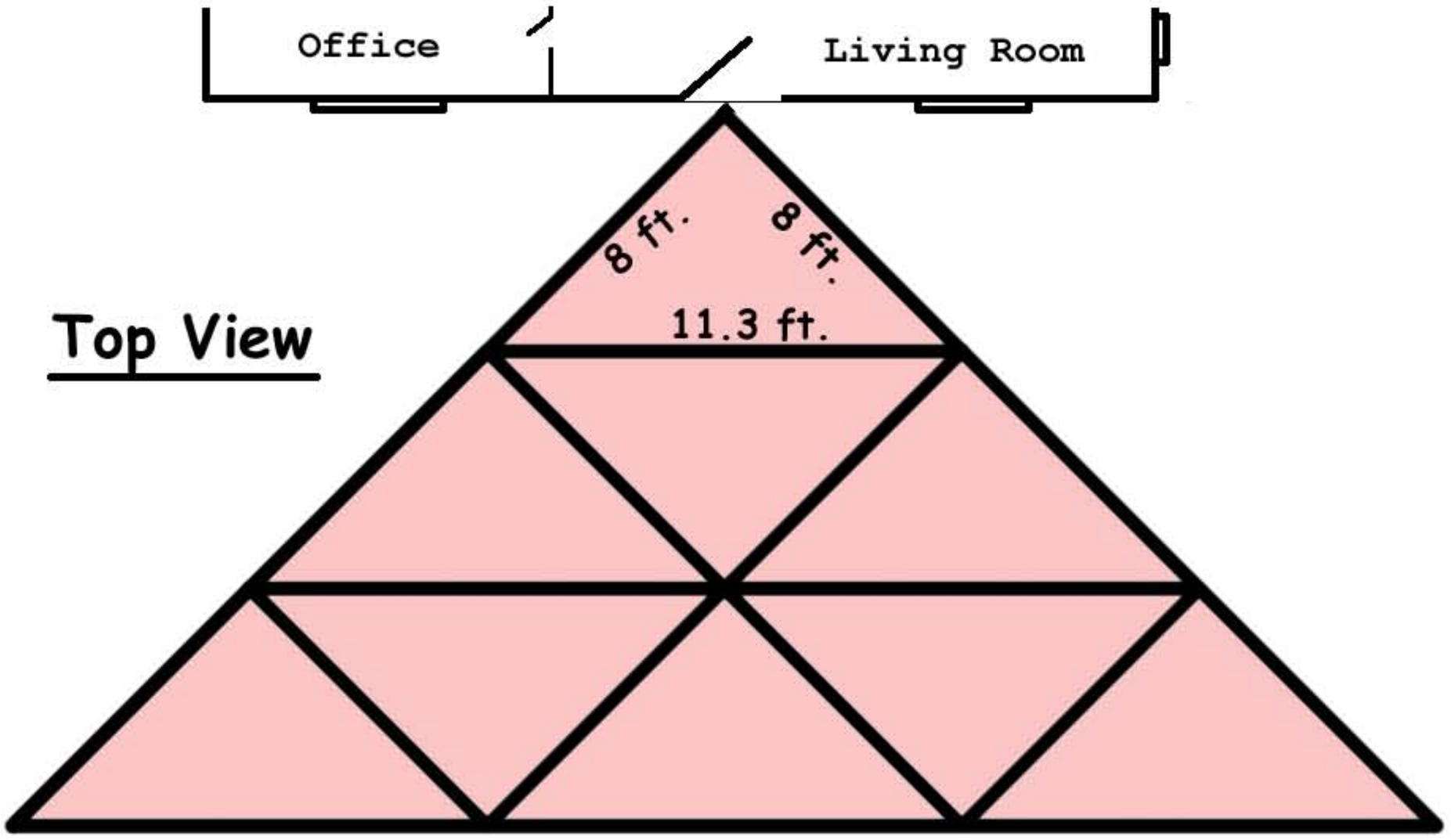
Mission-Simulation Assignment
Operation Bricklayer - Answer Key

Dr. Winnie has decided to redo the walk in front of her house with unusual **right-triangle bricks**. Each of the **nine large bricks are exactly identical**: the base and height are 8 feet each, and the hypotenuse is 11.3 feet.



Top View

Step A

What is the total area of Dr. Winnie's new walkway?

288 sq. ft.

Step B

- Use what you know about area to explain why the area you calculated for Dr. Winnie's walkway is correct. Use words and numbers to explain your thoughts.

Answers will vary. Most students will calculate the area of one triangle using the formula $A = \frac{1}{2}$ (8 x 8), finding the area of one triangle as 32 sq. ft. Multiplying the area of one triangle by the 9 triangles in the walkway equals the total area of 288 sq. ft. Other approaches include seeing the shape as a single large triangle (sides of 24 feet), or breaking the shape into four squares and a single triangle.

- **Suppose Dr. Winnie decides to use different triangular bricks that have a base of 4 and height of 4. Use words, numbers, and/or symbols to explain how using the different bricks will affect the total area of the 9-brick walkway.**

Students should find the area of one triangle to be 8 sq. ft. ($A = \frac{1}{2}(4 \times 4)$), and the area of the entire walkway to be 72 sq. ft. (8 sq. ft. x 9 bricks). All students should note that this is less than half the area of the larger walkway. Advanced students might note that this is $\frac{1}{4}$ the area of the larger walkway because both the base and height of each triangle is cut in half (from 8 to 4): $A = \frac{1}{2}(\frac{1}{2}B \times \frac{1}{2}H) = \frac{1}{2}(\frac{1}{4}BH)$.