1. A volume problem:

   > The front and back of a storage shed are shaped like isosceles right triangles with two sides of length 10 feet, as shown on the left in Figure 1. The storage shed is 40 feet long. Determine the volume of the storage shed, explaining your reasoning.

   Qing solves the volume problem as follows. First, he uses the Pythagorean theorem to determine that the length of the unknown side of the triangle shown at the left is $\sqrt{200}$ feet long. Then, Qing uses the Pythagorean theorem again to calculate the height of the triangle h if the base is the side of length $\sqrt{200}$. Qing carries this out as follows:

   $$(\frac{\sqrt{200}}{2})^2 + h^2 = 10^2$$

   $$h^2 = 100 - \frac{200}{4} = 100 - 50 = 50$$

   $$h = \sqrt{50}$$

   Next, Qing determines that the floor area of the storage shed is

   $$40 \cdot \sqrt{200}$$

   square feet. Finally, Qing calculates that the volume of the storage shed is given by the floor area of the shed times the height of the triangle:

   $$40 \cdot \sqrt{200} \cdot \sqrt{50}$$

   (a) Is Qing's method of calculation correct? Explain why or why not.

   (b) Solve the volume problem in a different way than Qing did, explaining your reasoning.

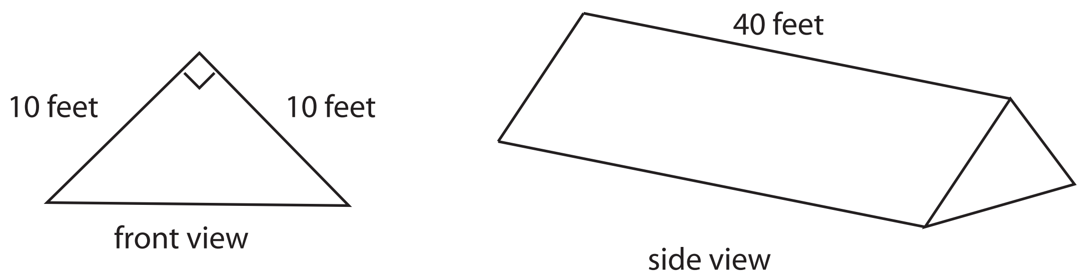

Figure 1: Determine the Volume