

**3.** [12 points]

Scott is having a graduation party, and his mom wants to order individual cakes for the guests. Each cake is a right circular cylinder with radius  $R$  centimeters, height  $H$  centimeters, and volume 250 cubic centimeters. In addition,

- there is a fixed cost of \$3 per cake;
- the entire side of the cake will have maize icing with blue candy “M”s, which costs \$0.02 per square centimeter; and
- the entire top of the cake will have blue icing, which costs \$0.01 per square centimeter.

Recall that the volume of a right circular cylinder with radius  $R$  and height  $H$  is  $V = \pi R^2 H$ .

- a. [4 points] Find a formula for the cost  $C$  of one cake, in terms of its radius  $R$ .
- b. [8 points] What radius and height should Scott’s mom choose for the cakes if she wishes to minimize her costs? What is the minimum price for one cake? (To get credit, you must fully justify your answer using algebraic work.)

*radius* = \_\_\_\_\_      *height* = \_\_\_\_\_      *cost* = \_\_\_\_\_