Name:

You have 25 minutes to do this quiz. You may not use any books or notes while you do the quiz nor discuss the quiz with anyone. You may use a calculator. There is one page to the quiz.

1. The height, in units of meters, of a hill (above sea) is given by \( h(x, y) = 200 - 2xy^3 + 2x \) and the units for \( x \) and \( y \) are also meters.

   a. At the point \( (x_0 = 2, y_0 = 1) \) find the direction derivative of \( h \) in the direction of the vector \( \vec{u} = (\sqrt{3}/2, 1/2) \). Include units in your answer.

   b. At the point \( (x_0 = 2, y_0 = 1) \), in what direction does the height decrease most rapidly?

   c. If you start at the point \( (x_0 = 2, y_0 = 1) \) and move in the direction given by (b), what is the rate of change in the height that you get. Give units.

Self evaluation: (Circle) Do you feel your performance on the quiz was

\[ \text{Green} \quad \text{Yellow} \quad \text{Red} \]