1. A biologist studied the growth of a rabbit population in a field. She let \( f(t) \) represent the number of rabbits \( t \) weeks from the start of her research. Suppose that \( f'(9) = 8 \). Which of the following sentences must be true?
The correct answer is: (c) Nine weeks after the start of her research, the rabbit population was increasing by eight rabbits per week.

2. A model for the population of a town predicts the population \( t \) years from now to be given by \( P(t) = 800e^{-0.04t} \).
   (a) What population does this model predict for this town 30 years from now?
   \[ P(30) \approx 241.0 \text{ people} \]
   (b) How quickly in people per year is the population predicted to be changing 30 years from now?
   \[ P'(30) \approx -9.6 \text{ people per year} \]

3. On the graph of \( y = 4x^2 - 300 \), what is the slope of the curve at \( x = 10 \)?
   We note that \( y' = 8x \) and let \( x = 10 \) to obtain that the correct answer is: 80

4. Find derivatives of the following functions. Use Leibniz notation for the derivatives.
   (a) If \( y = \sqrt{2x^4 - 5x^2 + 4} \), then
   \[ \frac{dy}{dx} = \frac{1}{2} \left( 2x^4 - 5x^2 + 4 \right)^{-1/2} \left( 8x^3 - 10x \right) \]
   (b) If \( h = \frac{5}{t^2} \), then
   \[ \frac{dh}{dt} = -\frac{10}{t^3} \]
   (c) If \( P = 3re^{-r} \), then
   \[ \frac{dP}{dr} = 3e^{-r} - 3re^{-r} \]