1. An electronics company manufactures a mini calculator. The daily total cost of producing these calculators (in dollars) is given by 
   \[ C(x) = 0.0001x^3 - 0.08x^2 + 40x + 5000 \]
   where \( x \) stands for the number of calculators produced.
   
   (a) Find the exact cost of producing the 351st calculator.
   (b) Estimate the cost of producing the 458th calculator.
   (c) Compute \( C(400) \) and interpret the result.

2. A business has determined cost and revenue models for one of its products.
   \[ C(x) = 11x^2 + 7500 \]
   \[ R(x) = x^3 - 6x^2 + 65x \]
   \( x \) is the number of items that are produced and sold. \( C(x) \) and \( R(x) \) both have units of dollars.
   
   (a) Find the marginal average profit function.
   (b) Find the average profit and the marginal average profit when 35 items are produced.
   (c) Use the results from part (b) to estimate the average profit per item if 36 items are sold.

3. \( C(x) \) is the total cost (in dollars) of producing \( x \) items. If \( C(500) = 350 \) and \( C'(500) = 8.75 \) then find the total cost of producing 501 items.

4. You have an account that you started with $12,250.
   
   (a) How much money will be in the account after 10 years if the account pays an interest rate of 6.45% compounded continuously?
   (b) If you wanted the money to double in 10 years, what interest rate compounded continuously would you need?

5. A promissory note will pay $50,000 at maturity 5 years from now. The note has an interest rate of 6.4% compounded continuously. Note: the way a promissory note works is that you buy it for an amount (smaller than the face value or maturity value) and after a certain time period you will be paid the face value of the note. An example of this are treasury bills.
   
   (a) What is the note worth right now? i.e. if you bought this note right now what would you pay for it.
   (b) You bought the note and cashed it after 5 years. How much interest did you earn?

6. Find the derivatives of these functions. DO NOT SIMPLIFY YOUR ANSWERS.
   
   (a) \[ f(x) = \frac{x^5 + 7x}{x^3 - 8x^2} \]
   (b) \[ f(x) = \frac{7}{5 - x} \]
   (c) \[ y = (x^3 + 5x + 7)^{25} \]

7. Find the derivatives of these functions. DO NOT SIMPLIFY YOUR ANSWERS.
   
   (a) \[ y = e^{7x^3 - 6x^2 + 3} \]
   (b) \[ y = (5x^4 + e^{2x})^3x^2 \]
   (c) \[ y = \log(5x^3) \]