1. Your candy store sells chocolate bars for $2 per bar. It has fixed costs of $150 per day and each chocolate bar costs you $0.50 to make.
   a. Find the cost, revenue, and profit functions.
   b. What profit or loss results from the sale of 20 chocolate bars in a day?
   c. How many chocolate bars should be sold per day in order to break even?

2. Your company sells cell phone cases. In a typical week, you sell 500 units at a price of $10 per case, and you have a theory that you will gain 300 sales with a $6 decrease in price. Suppose your weekly fixed costs are $1000 and each case costs $2.
   a. Find the demand function as a function of price \( p \).
   b. Find the revenue, cost, and profit as a function of price \( p \).
   c. Find the largest possible weekly profit and the corresponding price per case.

3. One hour after taking ibuprofen, the amount in the bloodstream of a patient is 100 mg. Two hours after taking ibuprofen, the amount in the bloodstream is 50 mg.
   a. Find the amount of ibuprofen in the bloodstream \( Q(t) \) at time \( t \), assuming exponential decay. Please simplify your answer without \( \ln \).
   b. How long will it take for the amount of ibuprofen to decrease to 10 mg?

4. My bank advertises a savings account that will double my investment in 20 years.
   a. Find the rate of interest, assuming the interest is compounded continuously.
   b. At this rate, how much will an initial investment of $1000 be worth in 40 years? Please simplify your answer without \( \ln \).

5. Find the following limits:
   a. \( \lim_{x \to 1} \frac{4x^2 - 4}{x - 1} \)
   b. \( \lim_{x \to 1} \frac{1}{x^2 - x} \)
   c. \( \lim_{x \to \infty} \frac{-x^2 - 1}{x^3 - 1} \)
   d. \( \lim_{x \to -1} \frac{x^3 + 1}{x^2 + 3x + 2} \)
   e. \( \lim_{x \to -\infty} \frac{-x^3 + x + 1}{x + 1} \)
   f. \( \lim_{x \to 1^+} \frac{x^2 - 1}{x^2 - 2x + 1} \)