1. A young couple are saving to pay for their wedding in 4 years. If their wedding will cost $25,000, how much should they deposit into an account paying 7.65%, compounded continuously, in order to pay for their wedding.

2. Find the value of $23,200 deposited into an account paying 4.3% compounded daily for 7 years.

3. A $5,500 computer depreciates by 17% per year. Find its value after
   (a) 2 years
   (b) 6 months

4. A computer software store determines the demand function for a new videogame is given by
   \[ D(p) = \sqrt{200 - p^3}, \]
   where \( D(p) \) represents the number of videogames sold per day when the price is \( p \) dollars per game.
   (a) Calculate the elasticity of demand.
   (b) If the unit price is lowered slightly from $3, will the revenue increase or decrease?
   (c) If the unit price is increased slightly from $5, will the revenue increase or decrease?

5. How long will it take an investment to increase by 75% if it is deposited into an account paying 5.36%, compounded weekly?

6. Let \( f(t) = 3t^2 - 5t \).
   (a) Find the relative rate of change.
   (b) Evaluate the relative rate of change at \( t = 2 \).

7. An automobile dealer is selling cars at a price of $12,000. The demand function is given by \( D(p) = 3(30 - 0.002p)^2 \), where \( p \) is the price of a car. Should the dealer raise or lower the price to increase revenue?

8. Find the derivative of each function. You do not need to simplify.
   (a) \( f(x) = 5e^{4x^3} - \ln (3x + 2)^2 \)
   (b) \( g(x) = 8^{3x-7x^2} \)
   (c) \( h(x) = \log_7 (2e^{-x} - 5x) \)
   (d) \( k(x) = 4e^{\frac{3}{9x^2+1}} \)

9. Find the derivative of each function. You do not need to simplify.
   (a) \( g(x) = (5e^{2x^3} - \ln 6x)^7 \)
   (b) \( h(x) = \frac{\ln \sqrt{7x - 4}}{3x^5} \)
   (c) \( f(x) = 3e^{5x} \ln (5x^2 - 7x + 2) \)
   (d) \( k(x) = x^4 e^{7x} - \ln (4x + 2)^2 + \frac{4}{3x} \)
   (e) \( f(x) = | \ln(9x + 2) |^4 + 2xe^{7x/3} \)
ANSWERS

1. $P = $18, 409.67

2. $A = $31, 347.50

3. (a) $3, 788.95  
   (b) $5, 010.74

4. (a) $\frac{3p^3}{2(200 - p^3)}$
   (b) revenue decreases
   (c) revenue decreases

5. $t = 10.45$ years

6. (a) $\frac{6t - 5}{3t^2 - 5t}$
   (b) $\frac{7}{2}$

7. lower prices to raise revenue

8. (a) $f'(x) = 20e^{4x-3} - \frac{2(3x + 2)(3)}{3x + 2)^2}$
   (b) $g'(x) = (\ln 8) \left(8^{3x-7x^2}\right)(3 - 14x)$
   (c) $h'(x) = \frac{-2e^{-x} - 5}{(\ln 7)(2e^{-x} - 5x)}$
   (d) $k'(x) = 4\left(\frac{1}{3}\right)(9x^2 + 1)^{-2/3}(18xe^{(9x^2+1)^{1/3}}$

9. (a) $g'(x) = 7 \left(5e^{2x^3} - \ln 6x\right)^6 \left[5(6x^2)e^{2x^3} - \frac{1}{x}\right]$ 
   (b) $h'(x) = \frac{3x^5\left(\frac{1}{2}\right)7^{3x-1} - \left(\frac{1}{2} \ln(7x - 4)\right)(15x^4)}{9x^{10}}$
   (c) $f'(x) = 3e^{5x} \left(\frac{10x - 7}{5x^2 - 7x + 2}\right) + 15e^{5x} \cdot \ln(5x^2 - 7x + 2)$
   (d) $k'(x) = 7x^4e^{7x} + 4x^3e^{7x} - \frac{8}{4x+2} - \frac{4}{3x^2}$
   (e) $f'(x) = 4\left[\ln(9x + 2)\right]^3 \left(\frac{9}{9x+2}\right) + 2x \left(\frac{2}{3}\right)e^{7x/3} + 2e^{7x/3}$