Fill in your problems in the order of the sections (1.1 at the top and 1.9 at the bottom).

Questions for 1.1 Introduction to Functions (Michaela Minnick)

1. **For the function in this problem, find f (7):**

   $$f(x) = 3x - 9x^2$$

2. **Let C = f (t) represent coffee bean production in Brazil, in millions of pounds, where t is years since 2001. Interpret the statement f (13) = 52 in terms of coffee bean production.**

Questions for 1.2 Linear Functions (Will Goetzenberger)

1. **Solid waste generated each year in America is increasing. The solid waste generated, in millions of tons, was 254.5 in 1999 and 254.9 in 2006.**
   a. **Assuming that the amount of solid waste generated in America per year is a linear function of time, find a formula, using the two points, for this function.**
   b. **Predict the amount of solid waste generated in the year 2011.**

2. **John painted his room at a rate of 7 square meters per hour. After 4 hours of painting, he had 28 square meters left to paint.**
   a. **Let A(t) denote the area to paint (square meters) as a function of time *t* (hours). Assume that A is a linear function. Write the function's formula.**
   b. **Predict how many square meters John will have left after having painted for a total of 6 hours.**

(Claire Harris)

3. **A city's population is 10,411 in the year 2000. It is growing by 204 people each year.**
   a. **Give a formula for the city's population (P) as a function of the number of years, t, since 2000**
   b. **What is the population predicted to be in the year 2036?**
   c. **When is the population expected to reach 30,000?**

Questions for 1.3 Relative Change (Jesse Swearingen)

1. **Find the relative change in the price of a $75.99 pair of shoes, if the sale price is $52.99.**
2. **Find the sales price if the original price is $35.99 and the relative change is an reduction of 25%.**

Questions for 1.4 Applications of Functions to Economics (Spencer Buehler)

1. **A company makes radios. The factory and machinery needed to begin production are fixed costs. The cost of labor and raw materials are variable costs. Assume that the fixed costs for this company are $24000 and it costs $7q. Find the total cost to produce 50 radios.**

2. **If the company's revenue is given by $250q, find the breakeven point (round to nearest whole number).**

Questions for 1.5 Exponential Functions [p. 43 #2, 4, 6--12, 19] (Jackson Propst)

1. **A town has a population of 5121 people at t = 0. The population increases by 5% per year. Write a formula for the population P, of the town as a function of year t.**

2. **The world population is approximately $P = 6.4(1.0126)^t$, with P in billions and t in years since 2007.**

a. What is the percent rate of growth per year

b. What is the world population in 2007

c. Predict the world population in 2032

d. Find the average rate of change of the world population between 2004 and 2032

Questions for 1.6 The natural logarithm [p.50 #1--17,21,27--29]. (Alberto Palacio).

1. **Problem 1) : Solve the following Logarithmic Equations.**

- $4 + 3^{x+1} = 8$

2. **Problem 2) : Solve the following Logarithmic Equations.**

- $\dfrac{10}{1 + e^{-x}} = 2$

Questions for 1.7 Exponential Decay. (Sean O'Hara)

Problem 1) The EPA investigated a spill of radioactive iodine. The radiation level at the site was 2.4 millirems/hour. The level of radiation decays at a continuous hourly rate of k = -.04.
What was the level of radiation 24 hours later?

Find the number of hours until the level of radiation reached the maximum acceptable limit (0.6 millirems/hour).

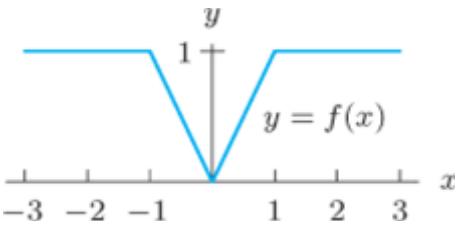
Problem 2) The quantity of Ozone, Q, is decaying exponentially at a continuous rate of 0.25% per year, what is the half-life of the Ozone?

Questions for 1.7 Exponential Growth. (Kevin Morill)

1. A plant starts out at a height of 20 inches. The plant grows continuously for 3 days growing to 33 inches. Assume that this growth is exponential. With this information find the growth rate of the plant.
2. Using the growth rate from question number one find the height of the plant after 15 days.

Questions for 1.8 New Functions From Old. (Taylor DeSimone)

2. Show the shift of the graph (below) when:
A) *y= f(x)+1*
B) *y= -f(x)+3*



Questions for 1.9 (Proportionality and Power Functions) Katie Stansell

1) Is the function below a power function? If so write it in the form of y=kx^p and give the values for k and p.

$$y=(6x^3)^2$$

2) The strength, S, of a beam is proportional to the square of its thickness, h. Write a formula representing the function.

3) A company finds that the average number of people attending a concert is 75 if the price is $50 per person. At a price of $35 per person, the average number of people in attendance is 120. Assume that the demand curve is a line. Write the demand, q, as a function of price, p.