Lab Assignment #6

This lab is due at 12:30 PM on Wednesday, 9/18 and is worth 10 points. This part may be done individually, or in a group of 2, 3, or 4 people.

1) A puppy weighs 2.9 pounds when it is born. Each week it gains about 1.8 pounds. Assume this growth model is valid for 40 weeks.

a) What is its weight after *n* weeks?

b) What is its weight after 13 weeks?

c) What is its weight after 38 weeks?

d) How old will the puppy be when it weighs 35 pounds?

e) How old will the puppy be when it weighs 45 pounds?

2) You have 289.3 grams of yarn when you start crocheting a scarf. Each row of the scarf uses the same amount of yarn (1.3 grams). Assume this (negative) growth model is valid until there is no yarn remaining.

- a) Find the amount of yarn you have remaining after you crochet *n* rows.
- b) How much yarn remains after 15 rows?
- c) How much yarn remains after 150 rows?
- d) How many rows will be completed when there are 90 grams of yarn remaining?
- e) How many rows can you crochet with this amount of yarn?

3) The Blue Romantics, an Elk Grove band, had 248 followers on Instagram on September 13. But after their appearance on KDVS, followers flocked to their insta, at an average of 5.8 new followers per day. Assume this growth model is valid until the end of time.

a) Find the number of followers n days after their radio appearance.

b) How many followers will they have on October 13 (30 days after their appearance)?

c) How many followers will they have next September 13 (365 days after their appearance)?

d) When will they reach 500 followers?

e) When will they reach 5000 followers?

4) Your brand-new car cost \$33,500. But it depreciates (loses value) at a rate of about \$240 per month. Assume this (negative) growth model is valid until the car is worth zero bucks.

- a) Find the value of the car *n* months after purchase.
- b) Find the value 16 months after purchase.
- c) Find the value 8 years after purchase.
- d) When will the car be worth \$10,000?
- e) When will the car be worth a big zero?

5) A balloon has volume 9.828 liters at 0°C. For each 1° increase in temperature, the volume increases by 0.036 liters. Assume this growth model is valid up to 150°C.

a) Find the volume of the balloon at temperature n° C.

b) Find the volume at 15°C.

c) Find the volume at 115°C.

d) Find the temperature where the balloon will be 12.0 liters.

e) Find the temperature where the balloon will be 14.0 liters.

f) Find the temperature where the balloon will be 9.0 liters. (This is not a trick question. The answer is legitimate.)

6) In the year 2000, United States residents consumed 840,000 pounds of rutabagas. This number has increased about 13,000 pounds per year since 2000. Assume this growth model is valid until the end of time.

a) Find a model for rutabaga consumption *n* years after the year 2000.

b) How many pounds of rutabagas were eaten in 2023?

c) How many pounds will be eaten in 2051?

d) In what year were about 1,000,000 pounds of rutabagas eaten?

e) In what year will about 1,200,000 pounds of rutabagas be eaten?