Name: _____
MATH 108
Spring 2024
HW 1: Due 01/24

"When I was young I observed that nine out of every ten things I did were fails, so I did ten times more work."

— George Bernard Shaw

Problem 1. (10pts) A certain subspecies of oak tree grows to an average height of 87 ft. After five years of growth, the growth rate of these oaks is approximately constant at a rate of 13 in per year. An ecologist finds the current height of an oak estimated to be 8 years in age to be 8 ft tall. Let $H(t)$ denote the height (in feet) of the tree t years from its 'birth.'

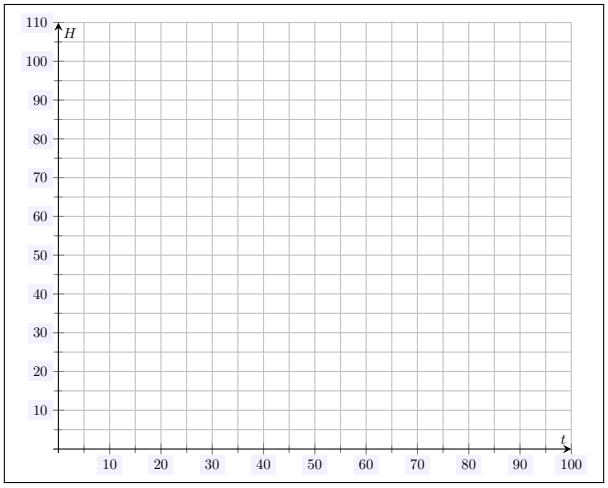
(a) Explain why $H(t)$ is approximately linear.

(b) Find $H(t)$ and sketch it in the plot below.

(c) Interpret the slope of $H(t)$.

(d) Interpret the y-intercept for $H(t)$.

(e) Find approximately how many more years until the tree reaches its 'adult height.'



Problem 2. (10pts) Compute the following:

(a) 76% of 8,571

(b) 16% of 56.8

(c) 155% of 11

(d) 78 decreased by 54%

(e) 280 increased by 40%

(f) 54 increased by 110%

Problem 3. (10pts) The economy in a certain nation is devolving into panic due to recent world events. Economists in the country are trying to keep track of the resulting inflation. A good which currently costs $30 is estimated to increase in price by 8% each month over the next 2 months.

(a) How much will the good cost after the end of the two months? Be sure to justify your answer.

(b) Is your answer in (a) the same as raising the original price by 16%? Explain.

(c) If the price simply increased to $40, by what percentage did the price increase from the original price?

(d) If the inflation continues at this rate, how much will the good cost two years from now?