

MAT 17A Winter 2026

Homework 1

Due before 10:00 AM on Monday, January 12

Please write the homework solutions in connected sentences and explain your work. Mark the answers to each question. Scan or take pictures of your homework and upload it to Gradescope before due time.

1. (10 points) Cerebrospinal fluid is continually produced and reabsorbed by the body at a rate that depends on its current volume. A medical researcher finds that absorption occurs at a rate of 0.35 mL/min when the volume of fluid is 150 mL and at a rate of 0.14 mL/min when the volume is 50 mL.

(a) Suppose the absorption rate A is a linear function of the volume V . Sketch a graph of $A(V)$.

(b) What is the slope of the graph and what does it represent?

(c) What is the A -intercept of the graph and what does it represent?

Graph the functions below by hand, not by plotting points, but by starting with the graph of one of the standard functions, and then applying the appropriate transformations. Plot the graphs of the functions at all intermediate steps.

2. (10 points) $y = 2 - \frac{1}{x+5}$

3. (10 points) $y = 1 + 3e^{-x}$.