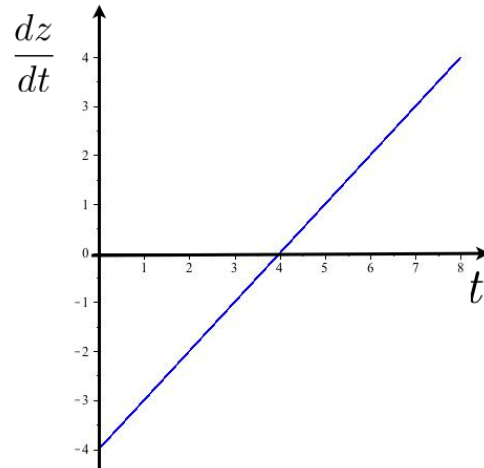


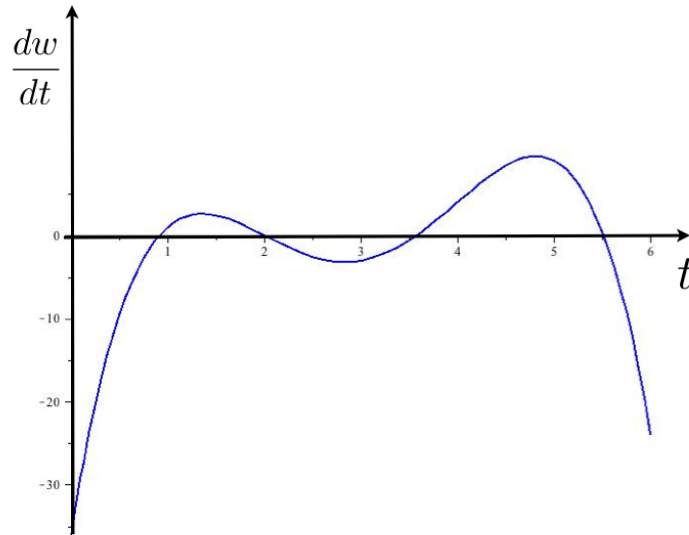
**Math 155. Homework 9. Section 4.1.**

1. Use the graph of the rate of change to sketch a graph of the function, starting from the given initial condition.

(a) Start from  $z(0) = 1$



(b) Start from  $w(0) = 10$



2. (Adler, Section 4.1 number 12). Verify that  $z(t) = (t + 2)^2$  is a solution of the differential equation

$$\frac{dz}{dt} = 2\sqrt{z}.$$

What initial condition does this solution satisfy?

3. (Adler, Section 4.1, number 18). Let  $V(t)$  be the volume of the cell as a function of time  $t$ . Suppose that the cell starts at a volume of  $1000 \mu\text{m}^3$  at  $t = 0$  and loses volume at a rate of  $3t^2 \mu\text{m}^3/\text{s}$ . Write a differential equation and initial condition for the volume  $V(t)$ . Find a solution. Graph the solution and indicate whether the solution makes sense for all time.