1. A nurse takes care of 50 children in a preschool. Over winter break there was a flu virus discovered in the area and six days after the children returned to school one of them caught the virus. Over the next sixteen days it spread rapidly and then died out as people developed immunity. The nurse tracked the virus’ progress using a function \( V \) as follows: \( t \) days after the children returned she recorded that \( V(t) \) children were sick.

(a) (2pt) The center for disease control asks the nurse to report any incidents of the flu at the school. They track this virus through a function \( W \) as follows: \( t \) days after the first child contracted the virus, \( W(t) \) should be the percentage of students that were sick. (Note that 10 of 50 students is 20 percent, not 0.2 percent.) Write the function \( W \) as a transformation of the function \( V \).

(b) (3pt) The nurse’s best estimation for the graph of \( y = V(t) \) is shown below. Assuming that the graph below is accurate, sketch the graph of \( y = W(t) \) on the same axes.

2. (5pt) The graph of \( y = f(x) \) is shown below. Find an equation for \( f(x) \). You do not need to simplify your answer. (Assume that the parent function is \( p(x) = \frac{1}{x^2} \).)
3. The graph of \( y = f(x) \) is shown below. Note that \( f \) is a periodic function.

(a) (1pt) What is the period of \( f \)?

(b) (1pt) What is the amplitude of \( f \)?

(c) (1pt) What is the midline of \( f \)?

(d) (1pt) What is \( f(25) \)? (Approximate to two decimal places if necessary.)

(e) (2pt) Find all values of \( x \) such that \( f(x) = 2 \).

4. (5pt) A storm has damaged some power cables and the engineer repairing the damage needs to calculate the height of one of the support towers. One end of a particular cable is attached to the very top of the tower and the other end is free. The engineer looks in the schematics and finds that the cable is 75 ft long. If he holds on to the free end (assume that he keeps the end near the ground) then he can get at most 40 ft away from the base of the tower. How tall is the tower? Round to two decimal places.