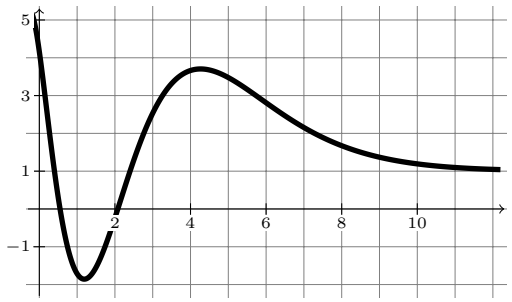
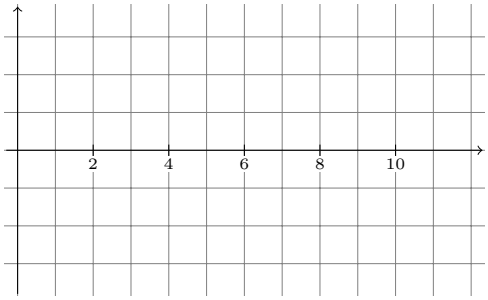
Name: _____

Directions: Show all work. No credit for answers without work.

1. The graph of $f(x)$ appears below.





   (a) [**1 point**] Estimate sthe point(s) x such that $f'(x) = 0$.

   (b) [**2 points**] Sketch the derivative $f'(x)$ in the space provided. Your sketch should capture the important features of $f'(x)$, including the ranges over which $f'(x)$ is positive, negative, increasing, and decreasing.

2. [**4 parts, 1 point each**] The quantity q (in thousands) of radios sold depends on the price p (in dollars). Let $q = f(p)$.

   (a) Translate into English: $f(60) = 80$. Be sure to include units.

   (b) Translate into English: $f'(60) = -4$. Be sure to include units.

   (c) Estimate the number of radios sold if the price is \$61.

   (d) Estimate the number of radios sold if the price is \$58.

3. [**3 parts, 1 point each**] Let $f(x) = 2x^2$.

   (a) Find the average rate of change in f over $[3, 4]$.

   (b) Find the average rate of change in f over $[3, 3 + h]$.

   (c) Use part (b) to find $f'(3)$.