1. (3 points) The graph of a function $f(x)$ is shown.

Only one of the functions below could possibly represent the derivative of $f(x)$. Which one?

(a) $f'(x) = x^2(x + 3)(x - 2)$

(b) $f'(x) = x(x + 3)^2(x - 2)$

(c) $f'(x) = x(x + 3)(x - 2)^2$

(d) $f'(x) = x^2(x - 3)(x + 2)$

(e) $f'(x) = x(x - 3)^2(x + 2)$

(f) $f'(x) = x(x - 3)(x + 2)^2$
2. (3 points) For $-2 < x < 2$, answer the following questions based upon the graph of $f(x)$ shown below.

(a) Is $f(x)$ positive, negative, or zero?

(b) Is $f(x)$ increasing, decreasing, or constant?

(c) Is $f(x)$ concave up, concave down, or neither?

(d) Is $f'(x)$ positive, negative, or zero?

(e) Is $f'(x)$ increasing, decreasing, or constant?

(f) Is $f''(x)$ positive, negative, or zero?
3. (4 points) Mr. Hopper thinks that rabbits make wonderful pets so he has decided to raise and sell them. In order to determine what price to charge, he has gone to three local pet stores and obtained the following information:

- *Pets Emporium* charges $12 per rabbit and usually sells 48 rabbits each month.
- *Pets R Us* charges $18 per rabbit and usually sells 39 rabbits each month.
- *Paws & Claws* charges $24 per rabbit and usually sells 30 rabbits each month.

(a) Find a formula for the number of rabbits \( q \) that a pet store should expect to sell each month as a function of the price \( p \) charged per rabbit, assuming that this function is linear.

(b) Find a formula for the revenue \( R \) that a pet store should expect to make each month as a function of the price charged per rabbit.

(c) Based upon your findings for the pet stores, what price per rabbit should Mr. Hopper charge in order to maximize his revenue? At this price, how many rabbits will he sell and how much revenue will he take in each month?