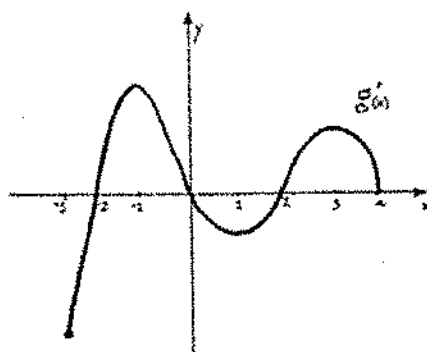


Curve Sketching Classwork

1. The figure below shows the graph of $g'(x)$.



- a) Determine the values of x for which g has a relative extrema. JYA with $g'(x)$.
- b) Discuss the concavity. JYA with $g'(x)$.
- c) Using the information in parts a) and b) and the fact that $g(-3) = 3$ and $g(4) = 6$, sketch a graph for g .

2. Sketch the function which is
 increasing on $(-\infty, 0)$ and $(2, +\infty)$,
 decreasing on $(0, 2)$,
 concave up on $(1, +\infty)$,
 Concave down on $(-\infty, 1)$,
 and has a
 relative maximum at $(0, 4)$,
 relative minimum at $(2, 0)$,
 point of inflection at $(1, 1)$.

3. Sketch the curve with the following properties:
 y-axis symmetry
 horizontal asymptote: $y = 0$
 vertical asymptotes: $x = -2$, $x = 2$
 increasing on $(0, 2)$ and $(2, +\infty)$
 decreasing on $(-\infty, -2)$ and $(-2, 0)$
 concave up on $(-2, 2)$
 concave down on $(-\infty, -2)$ and $(2, +\infty)$
 $f(0) = 2$

4. Sketch a curve that satisfies the following conditions:

$$\frac{dy}{dx} < 0 \text{ on } (-\infty, 0) \text{ and } (2, +\infty) \qquad \frac{dy}{dx} > 0 \text{ on } (0, 2)$$

$$\frac{d^2y}{dx^2} < 0 \text{ on } (1, +\infty) \qquad \frac{d^2y}{dx^2} > 0 \text{ on } (-\infty, 1)$$

$$f(0) = 0$$

$$f(2) = 4$$

$$f(1) = 1$$

5. Sketch a curve that satisfies the following conditions:

$$\frac{dy}{dx} > 0 \text{ on } (-\infty, 0) \text{ and } (2, +\infty)$$

$$\frac{dy}{dx} < 0 \text{ on } (0, 2)$$

$$\frac{d^2y}{dx^2} > 0 \text{ on } (1, +\infty)$$

$$\frac{d^2y}{dx^2} < 0 \text{ on } (-\infty, 1)$$

$$f(0) = 4$$

$$f(2) = 0$$

$$f(1) = 1$$

6. Sketch the function $y = f(x)$, given that

$$f(1) = 0$$

$$f'(x) > 0 \text{ for } x < 1$$

$$f'(x) < 0 \text{ for } x > 1$$

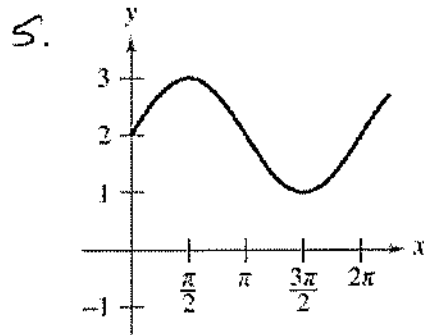
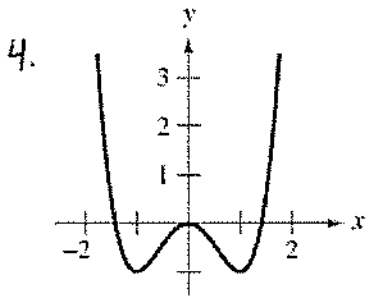
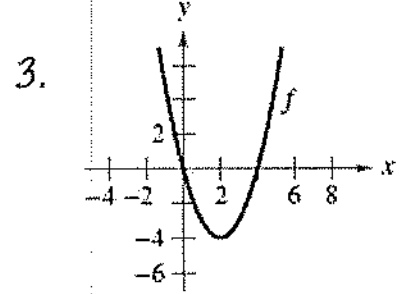
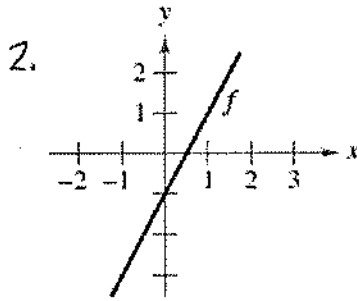
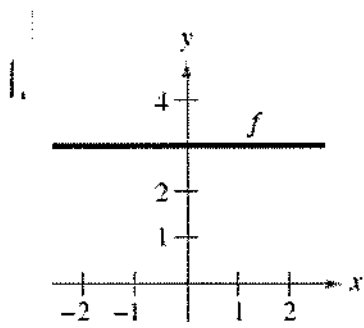
7. Sketch $y = f(x)$, given that

$$f(1) = -3$$

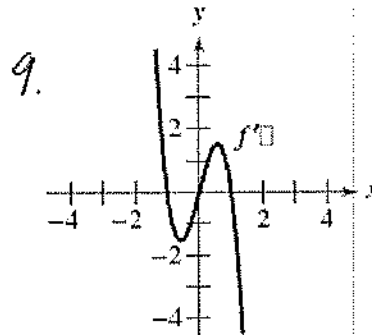
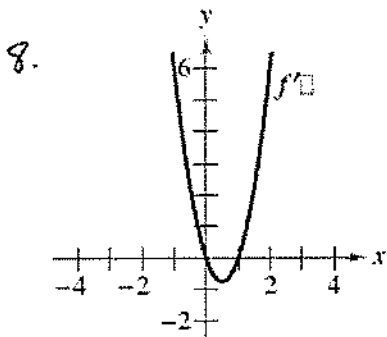
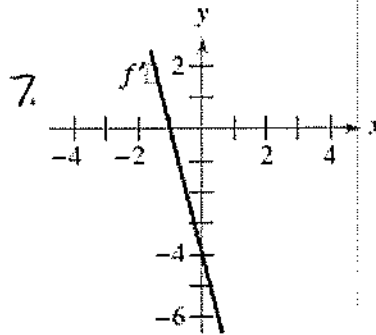
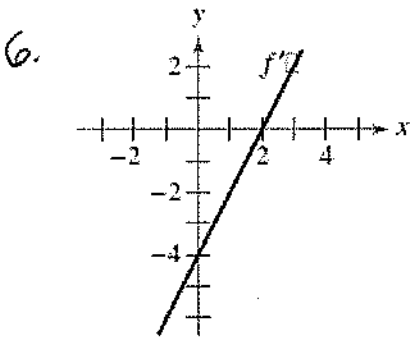
$$f''(x) > 0 \text{ for } x < 1$$

$$f''(x) < 0 \text{ for } x > 1$$

The graph of f is given below. Sketch a possible graph of f' and f'' .

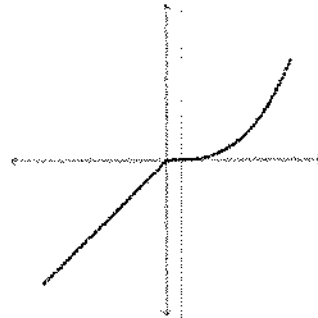
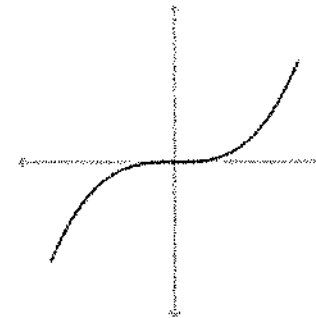
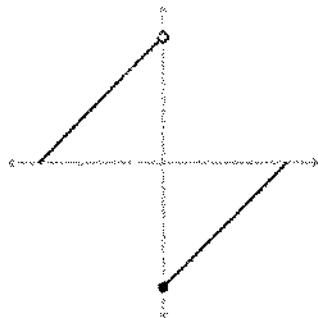
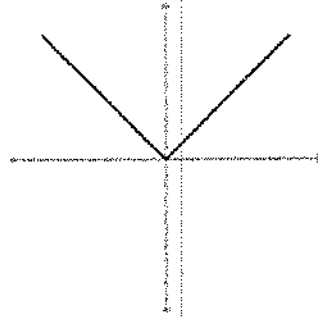
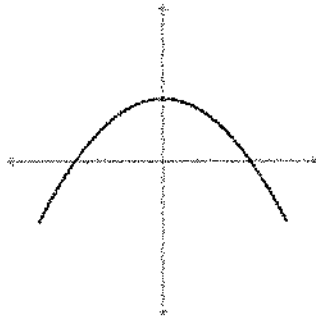
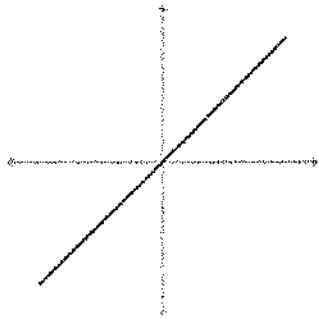


The graph of f' is given below. Sketch a possible graph of f .



Six graphs of functions are below, along with six graphs of derivatives. Match the graph of each function with the graph of its derivative.

Original Functions:



Their derivatives:

