4.3 Curve Sketching

Putting it all together Example 1

Find a) the first and second derivatives, b) the intervals of inc/dec, c) the intervals of concavity, and d) extrema and points of inflection.

$$f(x) = 2x^3 + 12x^2 + 18x + 6$$

Putting it all together Example 2

Find a) the first and second derivatives, b) the intervals of inc/dec, c) the intervals of concavity, and d) extrema and points of inflection.

$$f(x) = \frac{1}{2}x^4 + 2$$

Example 3: Find the missing value

Suppose that $g(x) = nx^2 + 8x + 4$ has a minimum at x = -4.
Determine the value of n.

Example 4: Sketch the graph

Sketch a graph with the following characteristics:

$f(2) = f(4) = 0$

$f'(x) < 0$ if $x < 3$

$f'(3)$ is undefined

$f'(x) > 0$ if $x > 3$

$f''(x) < 0$ for all $x \neq 3$

Example 5: Sketch the graph

Use the given conditions to determine which graph is a possible graph of the function $f(x)$.

a. $f(-3) = 2$

b. $f'(-3) = 0$

c. $f'(x) < 0$ if $x < -3$

d. $f'(x) > 0$ if $x > -3$

e. $f''(x) > 0$ for all x