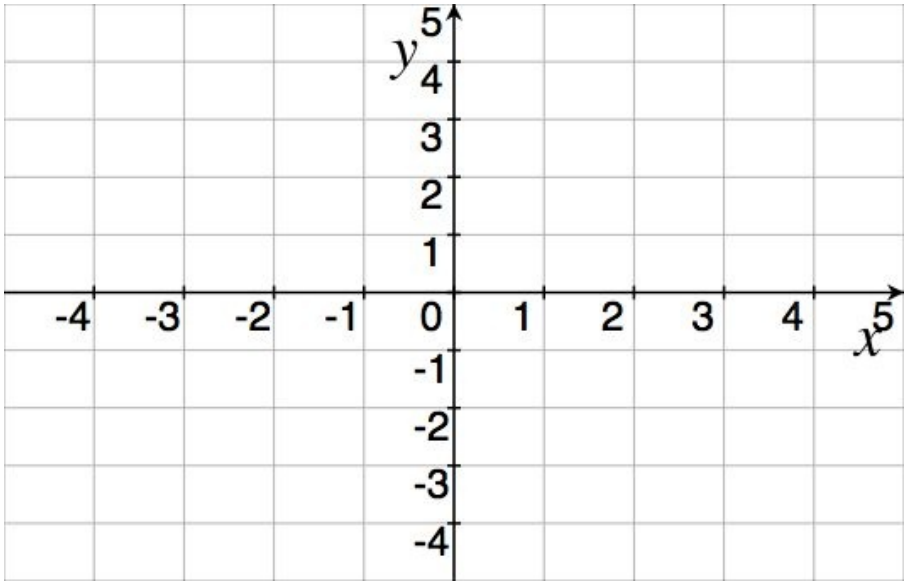
Extrema §4.1

1. Draw graphs of two functions f and g so that:

   (a) f is continuous on $[0, 5)$
   (b) f has a local max when $x = 3$
   (c) $f'(3) = 0$
   (d) g is continuous on $(-5, 0]$
   (e) g has a local max when $x = -3$
   (f) $g'(-3)$ is not defined.



2. Consider $m(x) = x^3 - 9x^2 - 48x - 5$.

   (a) Find the critical points of m.

   (b) Find all local extrema and their values.

Mean Value Theorem §4.2

1. Consider the function $f(x) = \cos 2x$ with a domain of $[\pi/8, 7\pi/8]$.

   (a) State Rolle's Theorem.

   (b) Verify the three hypotheses of Rolle's Theorem.

   (c) Find all numbers c that satisfy the conclusion of Rolle's Theorem.

2. Exhibit the Mean Value Theorem for $y = x^3 + x - 1$ on the interval $[1, 2]$.