# The Second Derivative Test

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The Second Derivative Test is helpful to use in determining the relative maxima and minima of the *original* function.

Let $f$ be a function such that $f'(c) = 0$ and the second derivative of $f$ exists on an open interval containing $c$.

1. If $f''(c) > 0$, then $f(c)$ is a relative minimum.
2. If $f''(c) < 0$, then $f(c)$ is a relative maximum.

If $f''(c) = 0$, then the test fails...use the first derivative test.

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1. If $f$ has a critical number at $x = 2$ and $f''(2) = 3$, then what can you conclude about $f$ at $x = 2$?

2. Using the graph of $f''$ below, what is happening at $f(1)$ if $f'(x) = 0$ at $x = 1$?