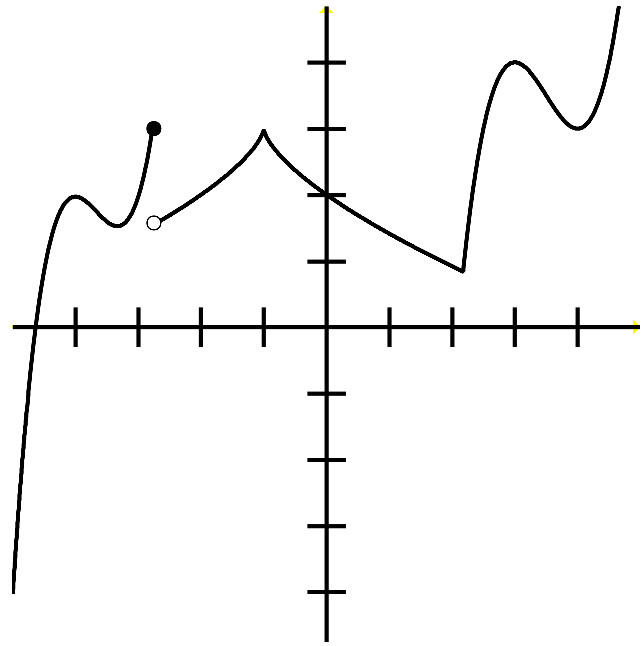
Name ____ Quiz 9, Calculus 1

1) Using the graph of $y = f(x)$ below, identify all of the local maximums and their corresponding maximizers.



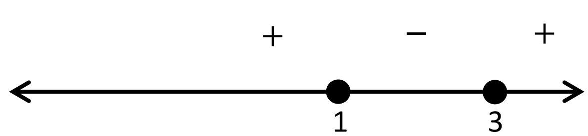
There are four local maximum values:
$f(x) = 2$ at $x = -4$
$f(x) = 3$ at $x = -3$
$f(x) = 3$ at $x = -1$
$f(x) = 4$ at $x = 3$

2) Given the function $f(x) = x^3 - 6x^2 + 9x + 12$, find any local minimum value(s) and corresponding minimizer(s).

We know all minimums occur when the derivative is zero (or doesn't exist):

$$f'(x) = 3x^2 - 12x + 9 = 0$$
$$x^2 - 4x + 3 = 0$$
$$(x-3)(x-1) = 0$$
$$x = 1, 3$$

Now we look at the signs of f to figure out if either of these are a minimum:



We then see that the minimizer is $x = 3$ and so the minimum value is $f(3) = 3^3 - 6 \cdot 3^2 + 9 \cdot 3 + 12 = 12$