First let's describe (graphically) how the signs of f' and f'' influence the graph of f:

	$f' > 0$	$f' < 0$
$f'' > 0$		
$f'' < 0$		

Let us work towards sketching the function $f(x) = x^2 + \frac{2}{x}$.

1. What is the domain of f?

2. Compute f'. Use that to find the critical points of f, and the intervals on which f is increasing or decreasing.

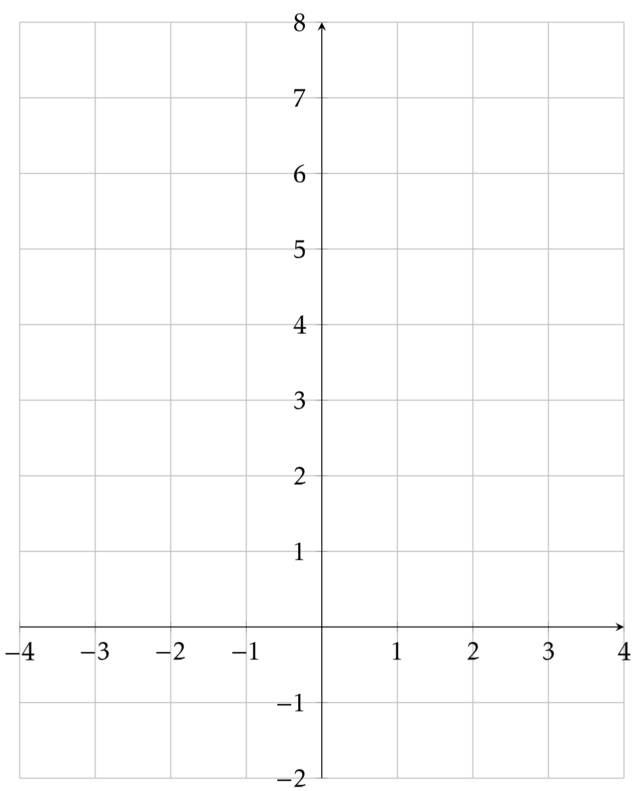
3. Compute f''. Use that to find the points of inflection of f, and the intervals on which f is concave up or concave down.

4. For each of the critical points of f, determine if they are local minima or maxima (or neither). If the second derivative test is inconclusive, try the first derivative test.

5. Find the horizontal and vertical asymptotes of f, if any.

6. Find the approximate values of f at its critical points and points of inflection. Also find where the graph of f crosses the x-axis and y-axis, if any.

Now you can sketch the graph of $f(x) = x^2 + \frac{2}{x}$!



Extra problem.

Sketch the graph of a twice-differentiable function $y = f(x)$ with the folwing properties. Label coordinates where possible.

x	**y**	**Derivatives**
$x < 2$		$y' < 0, y'' > 0$
2	1	$y' = 0, y'' > 0$
$2 < x < 4$		$y' > 0, y'' > 0$
4	4	$y' > 0, y'' = 0$
$4 < x < 6$		$y' > 0, y'' < 0$
6	7	$y' = 0, y'' < 0$
$x > 6$		$y' < 0, y'' < 0$