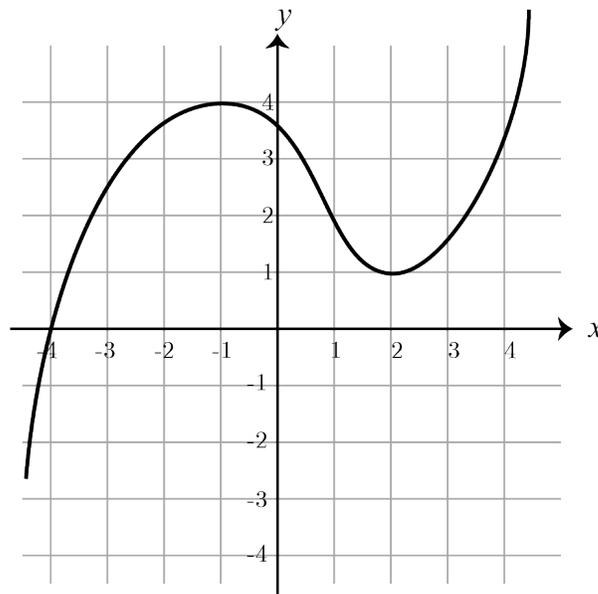


1. The given graph shows a function $y = f(x)$.

Find all intervals of x -values for which

- $f(x) > 0$
- $f'(x) > 0$
- $f''(x) > 0$



- Suppose $f(x) = (x-1)(x-4)(x-9) = x^3 - 14x^2 + 49x - 36$. Find the intervals on which $f(x)$ is concave up and the intervals on which $f(x)$ is concave down.
- Suppose $g'(x) = (x-1)(x-4)(x-9) = x^3 - 14x^2 + 49x - 36$. Find the intervals on which $g(x)$ is concave up and the intervals on which $g(x)$ is concave down.
- Suppose $h(x) = xe^x$. Find intervals where $h(x)$ is concave up and the intervals on which $h(x)$ is concave down.
- Sketch the graph of a continuous function $y = f(x)$ which satisfies the following:

$$f' > 0 \text{ for } x \text{ in } (-\infty, -1) \text{ and } (3, 5); f' < 0 \text{ for } x \text{ in } (-1, 3) \text{ and } (5, \infty)$$

$$f'' > 0 \text{ for } x \text{ in } (2, 5) \text{ and } (5, \infty); f'' < 0 \text{ for } x \text{ in } (-\infty, 2)$$

$$f(0) = 5, f(3) = 1$$