

Worksheet 10

Name:

1. Sketch a continuous function $f(x)$ with the following properties: $f'(-1) = 0$, $f'(3) = 0$, $f'(x) < 0$ on the interval $(-\infty, -1) \cup (3, \infty)$, $f'(x) > 0$ on the interval $(-1, 3)$, $f''(x) > 0$ on the interval $(-\infty, 2)$ and $f''(x) < 0$ on $(2, \infty)$. Make sure to indicate whether the points $x = -1, 2, 3$ correspond to local minima, local maxima, inflection points or neither.

2. Define $f(x) = x^2e^{-x}$.

(a) Find the global minimum and global maximum of the function $f(x)$ on the interval $1 \leq x \leq 10$.

(b) Does the answer in part (a) change if we instead consider the function on the interval $x \geq 1$?