

4-3 ROUTINE PROBLEMS

1. Given the function $f(x) = \ln(x^2 + 4)$ find the following. *For parts a-d, put your answer in a box.*

(a) Determine the domain of $f(x)$.

(b) Find the intervals of increase or decrease.

(c) Find the local maximum and minimum values.

(d) Find the intervals of concavity and inflection points.

(e) Use the information to sketch the graph.

2. Sketch a possible graph of a function f that satisfies the following conditions:

(a) f is continuous and differentiable on $(-\infty, \infty)$.

(b) $f(0) = 2$, $f(2) = 3$, $f(4) = 2$

(c) $f'(2) = 0$

(d) $f'(x) > 0$ for $x < 2$ and $f'(x) < 0$ for $2 < x$

(e) $f''(x) > 0$ for $4 < x$ and $f''(x) < 0$ for $x < 4$.