

### Extra problems for Section 4.5

In problems (A)–(E), you are given a formula for  $f'(x)$ ; in other words, you are given **THE DERIVATIVE** of  $f$ , not  $f$  itself.

In each problem:

- Find the critical numbers of  $f$ .
- Find the intervals of increase and decrease of  $f$ .
- Find the  $x$ -values of the inflection points and intervals of concavity of  $f$ .
- Sketch one possible graph of  $f$ . (There will be many different possible answers.)

A.  $f'(x) = \frac{x}{1+x^2}$

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

C.  $f'(x) = (\ln x)^2 - 4$  (consider only the domain  $x > 0$ )

D.  $f'(x) = (x - 3) \sin x$

E.  $f'(x)$  has the following graph, with domain  $[-3, 5]$ :

