

Math 1081, Quiz 4 Name: \_\_\_\_\_  
(The use of calculators is prohibited.)

1. Let  $f(x) = x^4 + 4x^3 + 4x^2 + 1$ .
  - (a) What is  $f'(x)$ ?
  - (b) What are the critical numbers of  $f$ ?
  - (c) On what intervals is  $f$  increasing/decreasing?
  - (d) Locate and identify any local extrema of  $f$ .

2. Let  $g(x) = (2x + 3) \ln(2x + 3)$ .

(a) What is the domain of  $g$ ?

(b) What is  $g'(x)$ ?

(c) What are the critical numbers of  $g$ ? (You should get  $x = \frac{e^{-1} - 3}{2}$ .)

(d) On what intervals is  $g$  increasing/decreasing?

(e) Locate and identify any local extrema of  $g$ .