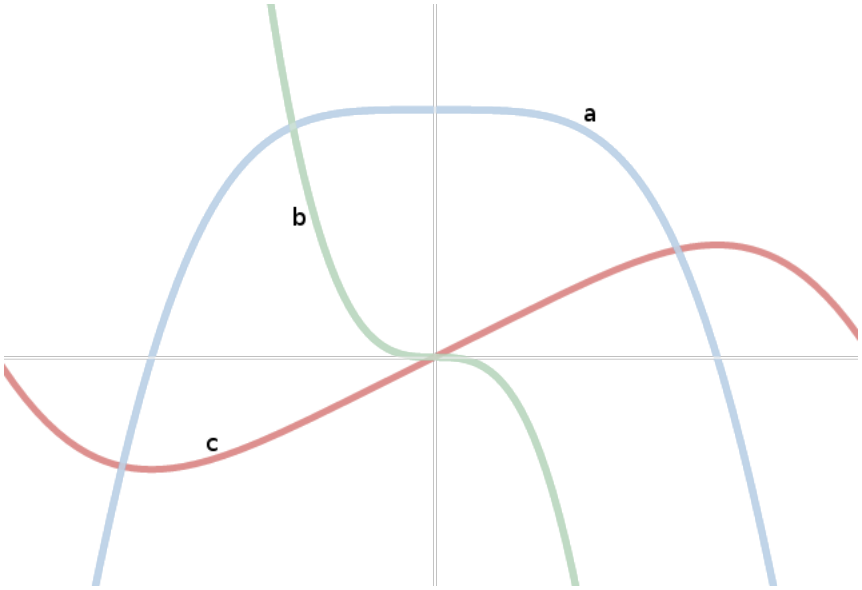
Name_____ September 27, 2016

Quiz 3

1. Let $f(x) = \sqrt[3]{x}$. Find f' and f''.

2. Let $f(x) = (x+1)e^x$. Find f'.

3. The figure shows the graphs of f, f', and f''. Identify each curve. You do NOT need to explain your choices.



(1) (3 pts)

$$f(x) = \sqrt[3]{x} = x^{\frac{1}{3}}$$

$$f'(x) = \frac{1}{3} x^{\frac{1}{3}-1} = \frac{1}{3} x^{-\frac{2}{3}}$$

$$f''(x) = \frac{1}{3}\left(-\frac{2}{3}\right) x^{-\frac{2}{3}-1} = -\frac{2}{9} x^{-\frac{5}{3}}$$

(2) (4 pts)

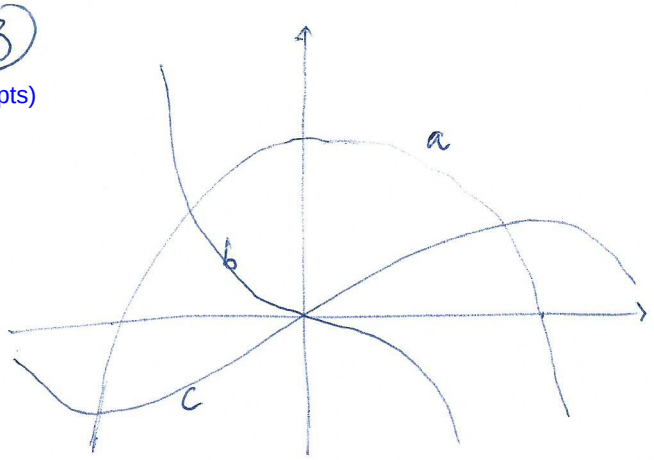
$$f(x) = (x+1)e^x$$

$$f'(x) = (x+1)'e^x + (x+1)(e^x)'$$

$$= 1 \cdot e^x + (x+1)e^x$$

$$= (x+2)e^x$$

(3) (3 pts)



Based on the facts that

- derivative measures the rate of change of a functio
- the rate of change is positive if the function is increasing, and is negative if the function is decreasing.

we conclude that

- the graph of f is c,
- the graph of f' is a,
- the graph of f'' is b.