

Math. 249, Practice MidTerm March 1, 2005 (1)

↓ Calculate the local linear approximation of

(18) $f(x) = \sqrt[3]{x+3}$ for values of x close to 5.

2

7 Show that the equation $x^3 = x^2 - x + 1$

has at least one solution in the interval $[0, 2]$,

13 justifying your work.

14

(a) Find $f'(x)$ if $f(x) = \frac{x^2 + 1}{x^3 - x + 7}$

20

(b) Find $f'(x)$ if $f(x) = \sec(\sqrt{x^2 - x})$

(4)

4 Let $f(x)$ be a differentiable function such that

(12) $f(-1) = 2$, $f'(-1) = 6$. Find the equation of the tangent line to the curve $y = f(x)$ at $x = -1$

(5)

PART B 35%

5 Find $\frac{dy}{dx}$ if $y^2 + \sin y = x$

6 If $f(x) = \frac{\sqrt{4x^2+3}}{x-1}$ then the horizontal asymptotes are _____

7 $\lim_{x \rightarrow 0} \left(\frac{|2x+4| - 4}{x} \right) =$ _____

8 If $f(x)$ is the usual bell curve then a rough sketch of $f'(x)$ is as follows.

9 $\lim_{x \rightarrow \frac{\pi}{4}} \left(\frac{\tan x - \tan \frac{\pi}{4}}{x - \pi/4} \right) =$ _____

10 True or False: $f(x) = \sin x$ is continuous for all x _____