

PRACTISE TEST #1

CALCULUS 103 - SEPT 15th '08

EVALUATE the FOLLOWING LIMITS (2 MARKS/ Each)

$$(1) \lim_{x \rightarrow 2} \frac{x^2 - x - 2}{x^2 - 4}$$

$$(2) \lim_{x \rightarrow 1} \frac{x^2 + 2}{x - 1}$$

$$(3) \lim_{x \rightarrow \infty} \frac{x^3 - 2x + 1}{3x^3 + 4x - 1}$$

$$(4) \lim_{x \rightarrow 0} \frac{\frac{1}{x-1} + \frac{1}{x+1}}{x}$$

(5) (6 MARKS)

DETERMINE whether the FOLLOWING FUNCTION is continuous at $x=1$.

Justify your answer using the DEFⁿ OF CONTINUITY.

$$f(x) = \begin{cases} x^2 - 1 & x > 1 \\ x^2 - 2x + 1 & x < 1 \\ 2 & x = 1 \end{cases}$$

(6) Find the derivative of $f(x) = 2x^2 - x + 1$ using the 'LIMIT DEFN' (4 MARKS)

(7) Find the derivatives of the following functions (2 MARKS EACH)

(a) $f(x) = x^2 - 3x + 5/2$

(b) $f(x) = \frac{1}{x^8} + x^{2/3}$

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

(d) $f(x) = x^{-7} + 281$

(e) $f(x) = (x+1)(2x+3)$

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