

## Reading Quiz #2

Name: \_\_\_\_\_ Class: \_\_\_\_\_ Student I.D. # \_\_\_\_\_

Read Sections 2.4-2.8(pages 113-171) and work out the following problems.

122.35 For what value of the constant  $c$  is the function  $f$  continuous on  $(-\infty, \infty)$ , where

$$f(x) = \begin{cases} cx^2 + 2x & \text{if } x < 2 \\ x^3 - cx & \text{if } x \geq 2 \end{cases}$$

122.53 Show that the function  $f$  is continuous on  $(-\infty, \infty)$ , where

$$f(x) = \begin{cases} x^4 \sin \frac{1}{x} & \text{if } x \neq 0 \\ 0 & \text{if } x = 0 \end{cases}$$

133.27 Find the limit  $\lim_{x \rightarrow \infty} (\sqrt{9x^2 + x} - 3x)$

134.39 Find the horizontal and vertical asymptotes of the curve  $y = \frac{2x^2 + x - 1}{x^2 + x - 2}$

143.35 The limit  $\lim_{x \rightarrow 5} \frac{2^x - 32}{x - 5}$  represents the derivative of some function  $f$  at some point  $a$ .  
State such an  $f$  and  $a$ .

145.54 Determine whether  $f'(0)$  exists, if

$$f(x) = \begin{cases} x^2 \sin \frac{1}{x} & \text{if } x \neq 0 \\ 0 & \text{if } x = 0 \end{cases}$$

156.25 Find the derivative of the function  $g(x) = \sqrt{1 + 2x}$  using the definition of derivative. State the domain of the function and state the domain of the derivative.

163.28 Let  $f(x) = x^4 - 2x^2$

(a) Use the definition of derivative to find  $f'(x)$  and  $f''(x)$

(b) On what intervals is  $f$  increasing or decreasing

(c) On what intervals is  $f$  concave upward or concave downward