

Quiz 1, Section 555

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1) Evaluate the limits (show your work).

$$a) \lim_{x \rightarrow 5^-} \frac{4x}{x-5} = \frac{\cancel{4(5)}}{\cancel{-(5)-5}} = \frac{20}{-10} = -2$$

$$\begin{cases} \lim_{x \rightarrow 5^-} \frac{4x}{x-5} = -2 \\ \lim_{x \rightarrow 5^+} \frac{4x}{x-5} = -2 \end{cases}$$

$$\frac{4(4.9999)}{4.9999-5} = \frac{24.9995}{-0.0001}, \quad \frac{4 \times 4.9999}{4.9999-5} = \frac{19.998}{-0.0001}$$

(-2)

$$b) \lim_{x \rightarrow 0} \frac{\sin 5x}{6x} = \frac{\sin 5(0)}{6(0)}$$

$$\frac{\sin(x)}{x} \cdot \frac{5}{6} \rightarrow \frac{1}{1} \cdot \frac{5}{6}$$

$$\frac{\sin(x)}{x} = 1$$

$\frac{5}{6}$

$$c) \lim_{x \rightarrow -\infty} \frac{5x^7 - 2x^5 + 8}{2x^3 + 7x^2 - 4}$$

(-∞)

2) Find a value for C that makes the function continuous.

$$f(x) = \begin{cases} 8x + 9x^{-1}, & x \geq 3 \\ -4x + C, & x < 3 \end{cases}$$

$$C = \left(36 + \frac{1}{27}\right) \text{ or } \left(\frac{973}{27}\right)$$

$$8(3) + 9(3)^{-1} \rightarrow 8(3) + \frac{1}{9(3)} = 24 + \frac{1}{27}$$

$$-4(3) + C = -12 + C$$

$$24 + \frac{1}{27} = -12 + C$$

$$36 + \frac{1}{27} = C$$

$$\frac{36}{1} + \frac{1}{27} \rightarrow \frac{972}{27} + \frac{1}{27} = \frac{973}{27}$$