Quiz 1, Section 555

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1) Evaluate the limits (show your work).

$$\boxed{\begin{array}{l} \lim\limits_{x \to 8^-} \frac{4x}{x-5} = -25 \\ \lim\limits_{x \to 5} \frac{4x}{-x-5} = -2 \end{array}}$$

a) $\lim\limits_{x \to 5^-} \frac{4x}{x-5} = \frac{4(5)}{-(5)-5} \cdot \frac{20}{-10} = \boxed{-2}$

If $\frac{4x}{-x-5}$ OR $\frac{}{}$ if $\lim\limits_{x \to 8^-}$

$\frac{4(4.999)}{4.999-5} = \frac{24.9995}{-0.0001}$, $\frac{4 \times 4.9993}{4.9993-5} = \frac{19.998}{-0.0003}$ $\boxed{-25}$

b) $\lim\limits_{x \to 0} \frac{\sin 5x}{6x} = \frac{\sin 5(0)}{6(0)}$

$\frac{\sin(x)}{x} \cdot \frac{5}{6} \to \frac{4}{1} \cdot \frac{5}{6}$

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

$\boxed{\frac{5}{6}}$

c) $\lim\limits_{x \to -\infty} \frac{5x^7 - 2x^5 + 8}{2x^3 + 7x^2 - 4}$ $\boxed{-\infty}$

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

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

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

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

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

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

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

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