Limits homework

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#s 5,25,39,55

5) $\lim\limits_{y \to 2^-} \dfrac{(y-1)(y-2)}{y+1}$

$f\left(-\tfrac{1}{2}\right)$

$$= \dfrac{(1)(0^-)}{3} = 0^-$$

$\lim\limits_{x \to 2^-} \dfrac{(x-1)(x-2)}{x+1} = 0^-$

$f(x)$

approx :)

y = 0

x = 2
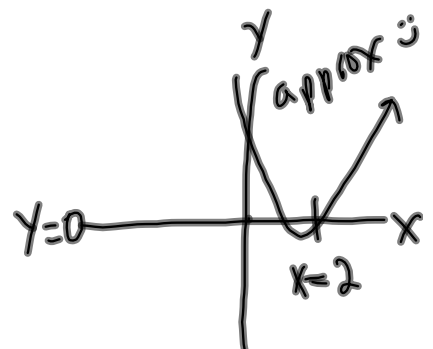
25)

$$\lim_{x \to 3^+} \frac{x}{x-3} = \frac{3}{3^+-3} = \frac{3}{0^+} = \infty$$

$$\lim_{x \to 3^-} \frac{x}{x-3} = \frac{3}{3^--3} = \frac{3}{0^-} = -\infty$$

55) $\lim\limits_{x \to 0} \dfrac{\sqrt{x+4} - 2}{x}$ $\qquad \dfrac{\sqrt{0+4} - 2}{0} = \dfrac{0}{0}$

indeterminate form

$\dfrac{\sqrt{x+4} - 2}{x} \cdot \dfrac{\left(\sqrt{x+4} + 2\right)}{\left(\sqrt{x+4} + 2\right)} = \dfrac{(x+4) - 4}{x\sqrt{x+4} + 2x} = \dfrac{x}{x\left(\sqrt{x+4} + 2\right)}$

$\overset{\color{red}(a+b)(a-b) = a^2 - b^2}{}$

$= \dfrac{1}{\sqrt{x+4} + 2}$

$= \dfrac{1}{4}$