MAC 2311 Quiz 3 Lectures 5 - 7

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1. (5 pts) Evaluate the following limit.

$$\lim_{x\to 2} \frac{x^2+x-6}{2x-4}$$

$$\lim_{x\to 2} \frac{x^2+x-6}{2x-4} = \lim_{x\to 2} \frac{(x+3)(x-2)}{2(x-2)} = \lim_{x\to 2} \frac{x+3}{2} = \boxed{\frac{5}{2}}$$

2. (5 pts) Find the vertical asymptotes of the function

$$f(x) = \frac{(x-1)(x-2)(x-3)}{(x-3)(x-4)(x-5)}$$

$$\lim_{x\to 3} f(x) = \lim_{x\to 3} \frac{(x-1)(x-2)}{(x-4)(x-5)} = \frac{2\cdot 1}{(-1)\cdot(-2)} = 1$$

$$\lim_{x\to 4^+} f(x) = -\infty \qquad \lim_{x\to 4^-} = \infty$$

$$\lim_{x\to 5^+} f(x) = \infty \qquad \lim_{x\to 5^-} = -\infty$$

$\Rightarrow$ vertical asymptotes at $x = 4$ and 5