Quiz 0, Math 111, Section 4 (Vinroot) Name: Student #3 8/20

(a): Compute the following limit (if it exists), making your steps clear: $\lim_{h\to 0} \frac{\frac{1}{3+h} - \frac{1}{3}}{h}$.

$$\lim_{h\to 0} \frac{\frac{1}{3+h} - \frac{1}{3}}{h} = \frac{\frac{1}{3+0} - \frac{1}{3}}{0} = \cancel{\frac{\frac{1}{3} - \frac{1}{3}}{0} = \frac{0}{0}}$$

This is undefined, so you can't sub in 0

First get a common denominator, then simplify (See solutions)

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Tells you that there could be a cancellation in the algebra

(b): Compute the following limit if it exists, and if it does not exist but is infinite, describe the infinite limit and explain (factor the denominator):

$$\lim_{x\to 1^-} \frac{x-4}{x^2-3x+2}$$

$$\lim_{x\to 1^-} \frac{x-4}{x^2-3x+2} = \lim_{x\to 1^-} \frac{x-4}{(x-2)(x-1)}$$

$$= \lim_{x\to 1^-} \frac{1-\cancel{3}4}{(1-2)(1-1)}$$

As written, this is undefined

0.999

$$= \frac{-2}{(-1)(-0.001)}$$

$$= \boxed{-\infty}$$

This is the right idea, but you can't say these things are equal

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Correct thinking

Correct answer!

One of these is a number, but the other isn't, so this does not quite make