

Math 170: Quiz 5

Sayan Mukherjee's discussion

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Problem 1. Find the following limit, with proof:

$$\lim_{x \rightarrow 3} \frac{\sqrt{x+1} - 2}{x - 3}.$$

Solution.

$$\lim_{x \rightarrow 3} \frac{\sqrt{x+1} - 2}{x - 3} = \lim_{x \rightarrow 3} \frac{(\sqrt{x+1} - 2)(\sqrt{x+1} + 2)}{(x - 3)(\sqrt{x+1} + 2)} = \lim_{x \rightarrow 3} \frac{(x + 1) - 4}{(x - 3)(\sqrt{x+1} + 2)} = \frac{1}{4}.$$

□

Rubric.

- +2pts for multiplying numerator and denominator with the conjugate
- +2pts for simplifying the fraction to $\frac{1}{\sqrt{x+1}+2}$, ie cancelling $(x - 3)$ off the numerator and denominator
- +1pt for correct answer ($\frac{1}{4}$)