MATH134: Week 2 Assignment

Due on October 12, 2020 at 5:45 PM

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Section 2.2 Problem 38

Give an ϵ, δ proof for the statement
$$\lim_{x \to 0} (2 - 5x) = 2$$

Proof. Let ϵ be given (arbitrary) and $\delta = \frac{\epsilon}{5}$. Suppose that for every $\epsilon > 0$ there exists $\delta > 0$ such that $\forall x$,

$$0 < |x - 0| < \delta \implies |(2 - 5x) - 2| < \epsilon$$
$$0 < |x| < \frac{\epsilon}{5} \implies |-5x| < \epsilon$$

Because the inequality above is true, therefore

$$\lim_{x \to 0} (2 - 5x) = 2$$

$\square$

Section 2.2 Problem 52

Give an ϵ, δ proof for the statement
$$\lim_{x \to 3} \sqrt{x + 1} = 2$$

Proof. $\square$