

Precise Definition of a Limit

A. Prove: $\lim_{x \rightarrow 3} (2x + 1) = 7$ (Divide your answer into three parts.)

1. State the Definition:

The statement _____ means:

For all _____, there exists a _____ such that

if _____ then _____.

2. Scratch Work to Find δ : (Start with the ε -inequality and manipulate it into the δ -inequality.)

Start with the ε -inequality:

Simplify the quantity inside the absolute values:

Divide both sides by the coefficient of x :

Identify δ :

$\delta =$ _____

3. Proof: (Reverse the steps from your scratch work.)

Given $\varepsilon > 0$, let $\delta =$ _____

Consequently, if _____,

then _____,

or _____