

**Math 4200**

Let  $f(x) = \sqrt{x + 1}$ . Show that  $\lim_{x \rightarrow 3} f(x) = 2$ .

1. Let  $\epsilon > 0$ . Sketch the graph of  $f$  and draw the horizontal lines  $y = 2 + \epsilon$ ,  $y = 2 - \epsilon$ .

2. Find the points where the graph of  $f$  intersects the two lines. Use these points and the graph of  $f$  to determine  $\delta_\epsilon$ .

3. Show that  $\delta_\epsilon$  works. Do the algebra.