

# Answer Key

10 points

Write your name on the other side of this page. All work must be shown on here; no extra papers will be graded.

Find the limit analytically if it exists:

a.  $\lim_{x \rightarrow -1} \frac{\sqrt{x+5}-2}{x+1}$

$$\frac{\sqrt{x+5}-2}{x+1} \cdot \frac{\sqrt{x+5}+2}{\sqrt{x+5}+2} = \frac{x+5-4}{(x+1)(\sqrt{x+5}+2)} = \frac{x+1}{(x+1)(\sqrt{x+5}+2)} = \frac{1}{\sqrt{x+5}+2}$$

\*  
Notation  
matters.

$$\lim_{x \rightarrow -1} \frac{\sqrt{x+5}-2}{x+1} = \lim_{x \rightarrow -1} \frac{1}{\sqrt{x+5}+2} = \frac{1}{\sqrt{-1+5}+2} = \frac{1}{\sqrt{4}+2} = \frac{1}{4}$$

None of  $\lim_{x \rightarrow -1} = \frac{1}{4}$   
business!

b.  $\lim_{x \rightarrow \infty} \frac{2x-3}{\sqrt{16x^2+2x-5}} = \frac{2}{\sqrt{16}} = \frac{2}{4} = \frac{1}{2}$

More work is better but  
this is ok.