SOLUTION #3 (8 AM)

Solution 1. *If $f(x)$ gets closer and closer to a number L as x gets closer and closer to c from both sides, then L is the limit of $f(x)$ as x approaches c. (2pts)*

Solution 2. (1) $\lim_{x\to 0} \frac{x(x+1)}{x^2+1} = \frac{0(0+1)}{0+1} = 0$ *(3pts)*

(2) $\lim_{x\to\infty} \frac{x^4+1}{8-x^3} = \lim_{x\to\infty} \frac{\frac{1}{x^3}(x^4+1)}{\frac{1}{x^3}(8-x^3)}$ *(1pt)*

$= \lim_{x\to\infty} \frac{x+\frac{1}{x^3}}{\frac{8}{x^3}-1}$ *(1pt)*

$= \lim_{x\to\infty} -x = -\infty$ *(1pt)*

(3) $\lim_{x\to\infty} \frac{1-\sqrt{x}}{1+\sqrt{x}} = \lim_{x\to\infty} \frac{\frac{1}{\sqrt{x}}(1-\sqrt{x})}{\frac{1}{\sqrt{x}}(1+\sqrt{x})}$ *(1pt)*

$= \lim_{x\to\infty} \frac{\frac{1}{\sqrt{x}}-1}{\frac{1}{\sqrt{x}}+1} = \frac{0-1}{0+1} = -1$ *(1pt)*