MATH 205 Spring 2002

## QUIZ 3 ANSWER KEY

Dr. Bogacki

Given the function f with the graph below, evaluate each expression.



List all the x values where f is discontinuous: x = 0, x = 1

At which of these x values is f continuous from the left? x = 0

Evaluate each limit. (If the limit is  $-\infty$  or  $\infty$ , indicate so.)

$$\lim_{x \to \infty} \frac{x^3 - x + 1}{(2x - 3) \cdot x^2} = \lim_{x \to \infty} \frac{x^3 - x + 1}{2x^3 - 3x^2} = \lim_{x \to \infty} \frac{\frac{x^3}{x} - \frac{x}{x} + \frac{1}{x}}{\frac{2x^3}{x^3} - \frac{3x^2}{x^3}}$$
Divided both the numerator and denominator by  $x^3$ .  

$$= \lim_{x \to \infty} \frac{1 - \frac{x}{x} + \frac{x}{x^3}}{2 - \frac{3}{x}} = \frac{1}{2}$$

$$\lim_{x \to -\infty} \frac{\sqrt{x^2 + 2}}{x} = \lim_{x \to -\infty} \frac{\sqrt{\frac{x^2}{x} + \frac{2}{x^2}}}{\frac{x}{-x}}$$
Divided both the numerator and denominator by  $\sqrt{x^2} = -x$  (since x approaches **negative** infinity, we can assume  $x < 0$ )