

# Math 171 - Quiz 8

October 24, 2018

Name key

Score \_\_\_\_\_

Show all work to receive full credit. Supply explanations when necessary.

1. (4 points) Find the critical numbers of  $f(x) = \frac{x^2}{(x-1)}$ .

$$f'(x) = \frac{2x(x-1) - x^2}{(x-1)^2} = \frac{x^2 - 2x}{(x-1)^2} = \frac{x(x-2)}{(x-1)^2}$$

$$f'(x) = 0 \Rightarrow x = 0, x = 2 \quad (\text{BOTH ARE CRIT. \#s})$$

$$f'(x) \text{ DNE} \Rightarrow x = 1 \quad (\text{NOT A CRIT \#, NOT IN DOMAIN})$$

CRIT NUMBERS ARE  
 $x = 0, x = 2$

2. (6 points) Find the absolute extreme values of  $g(x) = x^3 - 3x^2 + 3x - 1$  on  $[-4, 3]$ .

$$g'(x) = 3x^2 - 6x + 3 = 3(x^2 - 2x + 1) \\ = 3(x-1)^2$$

$$g'(x) = 0 \Rightarrow x = 1$$

$$g(1) = 0$$

$$g(-4) = -125 \quad \leftarrow \text{Abs min}$$

$$g(3) = 8 \quad \leftarrow \text{Abs max}$$