

# Math 171 - Quiz 7

October 16, 2014

Name key

Score \_\_\_\_\_

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

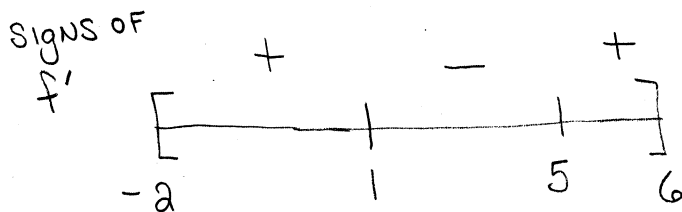
(10 points) Let  $f(x) = x^3 - 9x^2 + 15x + 3$  for  $-2 \leq x \leq 6$ . Find open intervals on which  $f$  is increasing/decreasing. Also identify all relative and absolute extreme values.

$$f(x) = x^3 - 9x^2 + 15x + 3, \quad [-2, 6]$$

$$f'(x) = 3x^2 - 18x + 15$$

$$= 3(x^2 - 6x + 5) = 3(x-5)(x-1) = 0$$

$$\Rightarrow x = 5, x = 1$$



$f$  is increasing on  $(-2, 1) \cup (5, 6)$

$f$  is decreasing on  $(1, 5)$

$$f(-2) = -71 \leftarrow \text{Abs min}$$

$$f(1) = 10 \leftarrow \text{Rel max, Abs max}$$

$$f(5) = -22 \leftarrow \text{Rel min}$$

$$f(6) = -15$$