

# Math 157 - Quiz 8

October 26, 2016

Name key

Score \_\_\_\_\_

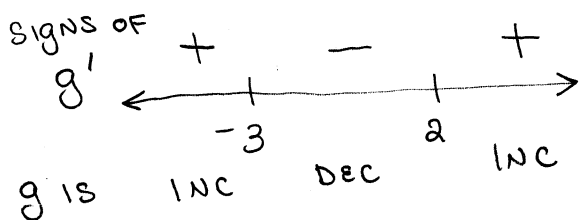
Show all work to receive full credit. Supply explanations when necessary.

1. (6 points) Let  $g(x) = 4x^3 + 6x^2 - 72x + 10$ . Find open intervals on which  $g$  is increasing/decreasing. Also identify all relative extreme values.

$$g'(x) = 12x^2 + 12x - 72$$
$$= 12(x^2 + x - 6) = 12(x+3)(x-2)$$

$$g'(x) = 0 \Rightarrow x = -3 \text{ or } x = 2$$

$g'(x)$  DNE NOWHERE.



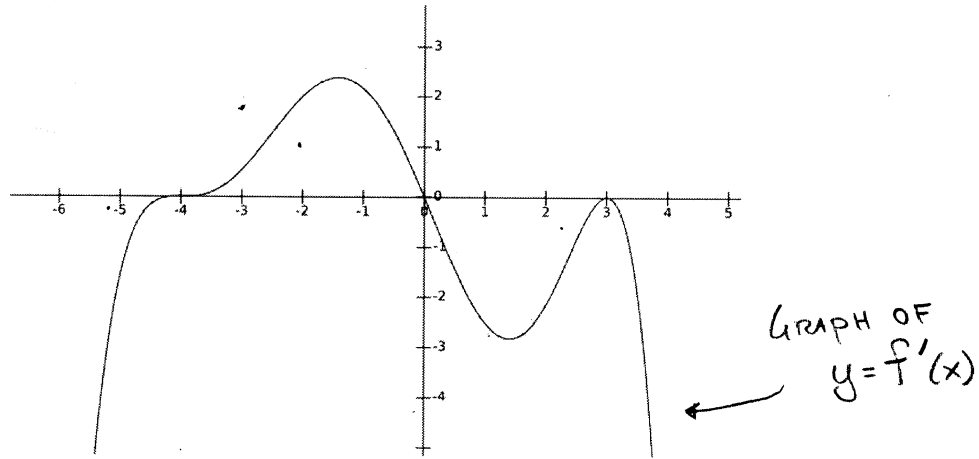
$g$  IS INCREASING ON  $(-\infty, -3) \cup (2, \infty)$ .

$g$  IS DECREASING ON  $(-3, 2)$ .

$$g(-3) = 4(-27) + 6(9) - 72(-3) + 10 = 172 \text{ IS A REL MAX.}$$

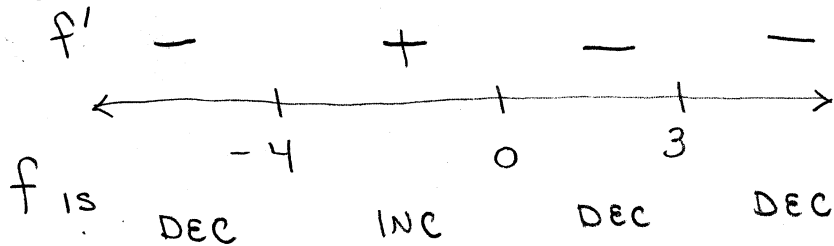
$$g(2) = 4(8) + 6(4) - 72(2) + 10 = -78 \text{ IS A REL MIN.}$$

2. (4 points) The graph of the **derivative** of the function  $f$  is shown below. I repeat!... The graph of  $f'(x)$  is shown below. Find the critical points of  $f$  (not its derivative!), mark them on a number line, and find open intervals on which  $f$  is increasing/decreasing.



CRIT PTS OF  $f$  ARE ZEROS OF  $f'$ :  $x = -4, x = 0, x = 3$

SIGNS OF



$f$  IS DECREASING ON  $(-\infty, -4) \cup (0, 3) \cup (3, \infty)$   
 & INCREASING ON  $(-4, 0)$ .