

Name: \_\_\_\_\_

Date: \_\_\_\_\_

## Calculus 12 LG 1 Quiz Ver A

/24

1. If  $f(x) = x^2 + 3x - 10$

a) For what values of  $x$  is  $f(x)=0$ ? (2 marks)

$$(x+5)(x-2) = 0$$

$$x+5=0 \quad x-2=0$$

$$x = -5 \quad x = 2$$

b) For what values of  $x$  is  $y \geq 0$ ? (2 marks)

$$x \leq -5$$

$$x \geq 2$$

c) Does the function have a maximum or a minimum? What is the maximum or minimum  $y$  value and for what  $x$  value does it occur at? (2 marks)

IT HAS A MINIMUM.

IT OCCURS AT  $(-1.5, -12.25)$

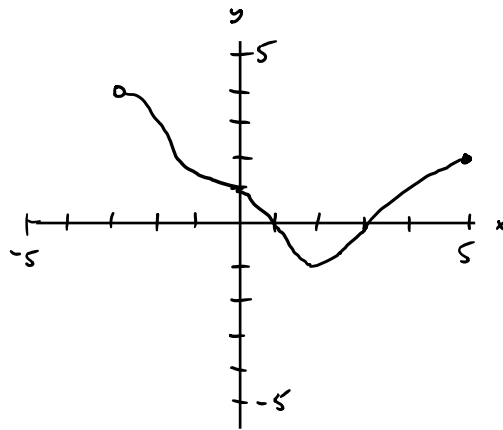
2. Write the equation of the function  $y = |x - 3| - 1$  in piecewise form.

(3 marks)

$$y = \begin{cases} x - 4, & x \geq 3 \\ 2 - x, & x < 3 \end{cases}$$

3. Determine the domain and range of the following functions. (2 marks each)

a)



$$D: (-3, 5]$$

$$R: [-1, 4)$$

b)  $y = \frac{x^2 - 3x - 10}{x + 2}$

$$y = \frac{(x-5)(x+2)}{\cancel{x+2}}$$

$$D: x \neq -2$$

$$R: y \neq -7$$

4. If  $f(x) = 7 - 3x$  and  $g(x) = x^2 + 1$ , determine the following:  
(2 marks each)

a)  $f(x - 1)$

$$\begin{aligned} f(x-1) &= 7 - 3(x-1) \\ &= 7 - 3x + 3 \\ &= 10 - 3x \end{aligned}$$

b)  $g(2 - 3x)$

$$\begin{aligned} g(2-3x) &= (2-3x)^2 + 1 \\ &= 4 - 12x + 9x^2 + 1 \\ &= 9x^2 - 12x + 5 \end{aligned}$$

c)  $f \circ g$  or  $f(g(x))$

$$\begin{aligned} f(g(x)) &= 7 - 3(x^2 + 1) \\ &= 7 - 3x^2 - 3 \\ &= 4 - 3x^2 \end{aligned}$$

5. Determine the equation of a line that is parallel to  $2x + 3y = 7$  and goes through the point  $(-2, 5)$ . (3 marks)

$$3y = -2x + 7$$

$$y = -\frac{2}{3}x + \frac{7}{3}$$

$$m = -\frac{2}{3}$$

$$y - 5 = -\frac{2}{3}(x + 2)$$

$$3y - 15 = -2x - 4$$

$$2x + 3y - 11 = 0$$

$$\text{or } y = -\frac{2}{3}x + \frac{11}{3}$$