

Name: _____

Date: _____

Calculus 12 LG 1 Quiz Ver B

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1. If $f(x) = x^2 - 4x - 12$

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

$$x^2 - 4x - 12 = 0$$

$$(x - 6)(x + 2) = 0$$

$$x = 6 \quad x = -2$$

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

$$-2 < x < 6$$

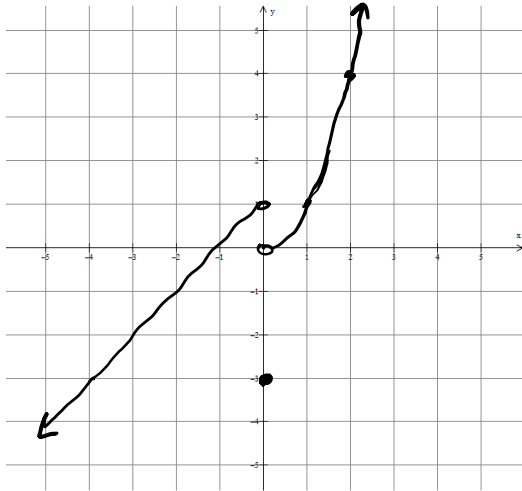
c) Does the function have a maximum or a minimum? What is the maximum or minimum y value and for what x value does it occur at? (2 marks)

THE FUNCTION HAS A MINIMUM AT $x = 2$

$$\text{AND THE MINIMUM IS } f(2) = 2^2 - 4(2) - 12 = -16$$

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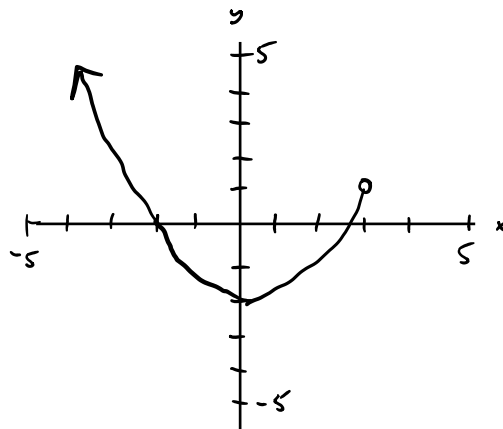
2. Write the equation of the function below in piecewise form. (3 marks)



$$f(x) = \begin{cases} x+1, & x < 0 \\ -3, & x = 0 \\ x^2, & x > 0 \end{cases}$$

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

a)



$$D: (-\infty, 3) \quad \text{or} \quad x < 3$$

$$R: [-2, \infty) \quad \text{or} \quad y \geq -2$$

b) $y = \frac{x^2 - 4}{x - 2}$

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

$$y = x+2, \quad x \neq 2 \quad \text{so} \quad y \neq 4$$

DOMAIN: $x \neq 2$

RANGE: $y \neq 4$

4. If $f(x) = x + 5$ and $g(x) = 1 - x^2$, determine the following:
(2 marks each)

a) $f(x + 1)$

$$f(x+1) = x+1+5 = x+6$$

b) $g(2x - 1)$

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

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

$$\begin{aligned} f(g(x)) &= 1 - x^2 + 5 \\ &= 6 - x^2 \end{aligned}$$

5. Determine the equation of a line that is perpendicular to $2x - 5y = 10$ and goes through the point $(1, -3)$. (3 marks)

$$2x - 5y = 10$$

$$-5y = -2x + 10$$

$$y = \frac{2}{5}x - 2$$

$$m = \frac{2}{5}$$

$$\begin{aligned} \text{So } m_{\perp} &= -\frac{5}{2} \\ \text{Eqn: } y + 3 &= -\frac{5}{2}(x - 1) \end{aligned}$$