

Exam # 2

Directions: Carefully read each question below and answer to the best of your ability in the space provided. You **MUST** show your work to receive full credit!

1. (10 points) Interpret the following in terms of distance on the number line:

$$|x + 6| > 4.$$

1. x is more than 4 units away from 6.
2. x is more than 4 units away from -6 .
3. x is more than 6 units away from 4.
4. x is more than 6 units away from -4 .
5. No solutions.

2. (15 points) Solve the following inequality for x . Express your answer in interval notation.

$$x^2 - 10x \leq -21$$

3. (8 points) Decide which of the following tables could describe a function. If a table could describe a function decide if it is one-to-one.

- | | | | | | |
|---------------|----|-------|----|-------|----|
| <i>Input</i> | -1 | 3 | 17 | -1 | 11 |
| <i>Output</i> | 4 | π | 4 | π | 6 |

- | | | | | | |
|---------------|----|----|-----|---|---|
| <i>Input</i> | -5 | 14 | 7.2 | 5 | 7 |
| <i>Output</i> | 9 | 3 | 9 | 6 | 1 |

- | | | | | | |
|---------------|----|---|----|----|-----|
| <i>Input</i> | -3 | 4 | -9 | 14 | 7 |
| <i>Output</i> | 1 | 6 | 1 | -7 | -14 |

4. (10 points) The function f is defined piecewise in the following way:

$$f(x) = \begin{cases} -x + 1 & \text{if } x \leq -3 \\ x^2 + 2 & \text{if } -3 < x \leq 4 \\ 9 & \text{if } x > 4. \end{cases}$$

Find the following:

- $f(-10) =$ _____
- $f(-3) =$ _____
- $f(0) =$ _____
- $f(4) =$ _____
- $f(300) =$ _____

5. (10 points) Let $f(x) = x^2 - 3x + 1$. Calculate the difference quotient $\frac{f(x+h) - f(x)}{h}$. **Simplify.**

6. (10 points) Find the average rate of change of $f(x) = x^2 - 3x + 1$ as x changes from -2 to 3 .

7. (10 points) Find the inverse function of $l(x) = 3x - 6$.

8. (15 points) Suppose $f(x) = \sqrt{x+2}$ and $g(x) = x^2 + 2$.

- Find the domain of $f(x)$.

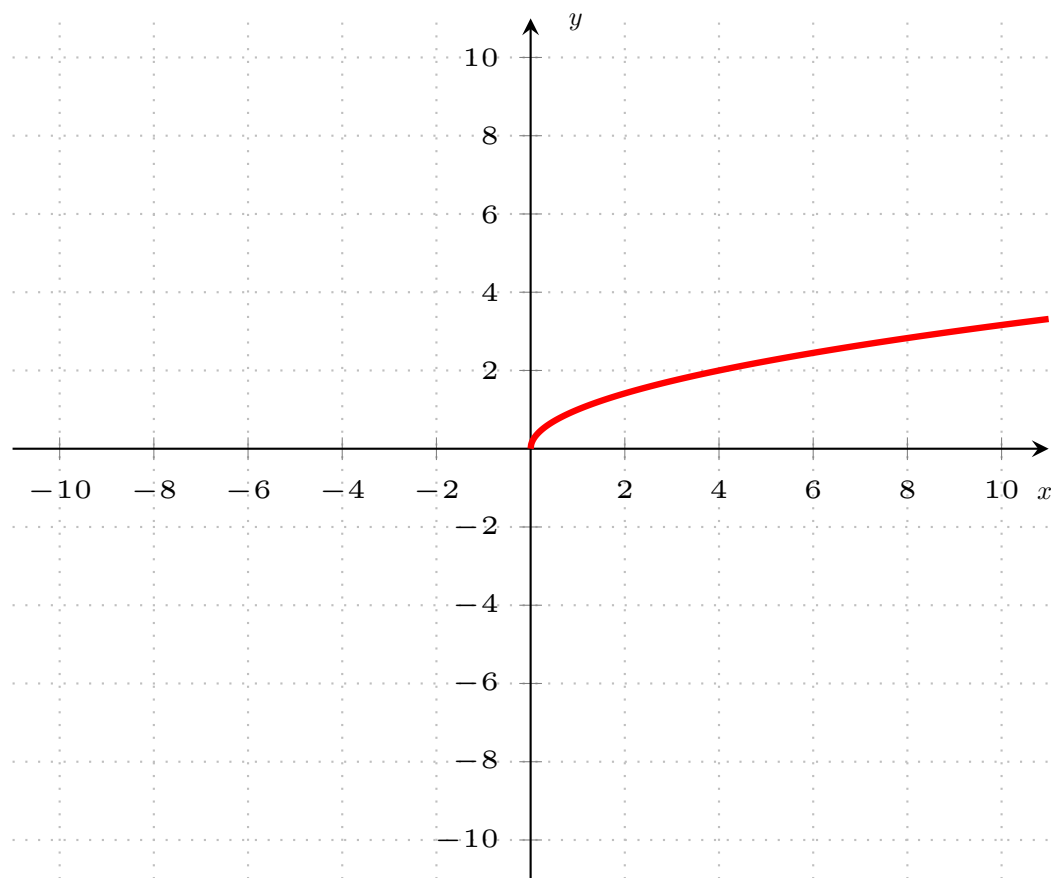
- Find the domain of $g(x)$.

- Find $f(g(x))$.

- Find $g(f(x))$.

- Find $g(g(x))$.

9. (12 points) Below is a graph of $y = \sqrt{x}$. On the same axes sketch a graph of $y = \sqrt{x+3} + 4$.



10. (10 points) BONUS: Spell your professor name ☺

Name: _____

Question:	1	2	3	4	5	6	7	8	9	10	Total
Points:	10	15	8	10	10	10	10	15	12	10	110
Score:											