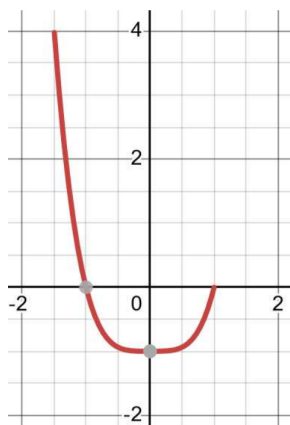**Kerry Ojakian's MTH 30 Class**
**Class Assignment #2**

1. Consider the function $F$ graphed below.



   (a) Evaluate $F(-1)$, $F(0)$, $F(1)$.
                (b) What is the domain and range of $F$?

2. For $g(u) = \dfrac{u+3}{(u-9)(u+21)}$, for which inputs is $g$ undefined?

3. What is the domain of the function $f(x) = 17x^8 - x^6 + 23$?

4. What is the domain of the following function?
$$f(x) = \frac{x^2 + 25}{4(x-3)(2x+5)}$$

5. When is the following function undefined?
$$f(x) = \frac{x^2 + 25}{x^2 - x - 20}$$

6. Let $f(x) = \dfrac{(-9 + x)(2 + x)}{2(x - 1)(x + 17)}$.

   (a) Evaluate $f(0)$.

   (b) When is the function undefined?

7. Consider the following function: $f(u) = 10 + \sqrt{u}$.

   (a) Evaluate $f(4)$.

   (b) What is the domain of $f$?

8. Define $g(u) = \dfrac{-2}{\sqrt{u}}$. Where is $g$ undefined? What is its domain?

9. Let $f(x) = \dfrac{x(9 + 6x)(x - 5)}{4(x - 113)(3x + 66)}$.

   (a) Evaluate $f(0)$.

   (b) When is the function undefined?

   (c) What is the domain of the function?

   (d) Which $x$ values make $f(x) = 0$?

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10. Let $f(x) = \dfrac{(2x^2 + x)(x - 3)}{(x + 5)(x^2 + x - 2)}$.

   (a) Evaluate $f(3)$, $f(0)$, and $f(-1)$.

   (b) Determine the values of $x$ for which the function is undefined.

   (c) Determine the values of $x$ for which the function is defined.

   (d) What is the domain of the function?

   (e) For which inputs to the function is the output 0?

   (f) Find the values of $x$ such that $f(x) = 0$.

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11. **Determine which of the given values of the variable are solutions of the given inequality.**

   (a) $x = -7, -1,$ of $3x - 1 \leq -22$      (b) $x = -10, -4,$ of $2(x+3) \geq 0$

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12. **Represent the following sets on the real line.**

   (a) $x > 1$      (b) $x \leq 0$

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13. **Solve the inequality and graph its solution.**
   $2x + 7 > 15$

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14. **Solve the inequality and graph its solution.**
   $5x - 4 < 16$

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15. **Solve the inequality and graph its solution.**
   $6x - 5 < 2x - 13$

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16. **Solve the inequality and graph its solution.**
   $-(x - 2) + 4 > 7 - x$

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17. Find the domain of $f(x) = 7\sqrt{5x + 10}$.

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18. Find the domain of $f(x) = 7\sqrt[3]{5x + 10}$.

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19. Let
$$f(x) = \begin{cases} x - 2, & x \le -1, \\ 2x + 1, & x > -1. \end{cases}$$

Evaluate the following.

(a) $f(-2)$

(b) $f(-1)$

(c) $f(0)$

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20. Let
$$f(x) = \begin{cases} x^2, & x < 5, \\ -x, & x \ge 5. \end{cases}$$

Evaluate the following.

(a) $f(65)$

(b) $f(-5)$

(c) $f(5)$

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21. Let
$$h(x) = \begin{cases} x - 4, & x < 3, \\ 4 - x, & x > 3. \end{cases}$$

What is the domain of $h$?

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22. Find the domain of $f(x) = 43\sqrt{x + 25}$.

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23. Let
$$g(x) = \begin{cases} 4, & x \le 2, \\ \dfrac{3}{x - 1}, & x > 2. \end{cases}$$

What is the domain of $g$?

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24. Find the interval where the function is undefined: $f(x) = 6\sqrt{5x}$.

25. Find the interval where the function is undefined: $f(x) = \sqrt{4x - 6}$.

26. Let

$$f(x) = \begin{cases} \dfrac{3}{x-1}, & x \le 2, \\ 4, & x > 2. \end{cases}$$

What is the domain of $f$?