

Kerry Ojakian's MTH 28.5 Class

Due Date: Thursday April 18

HW #3

General Instructions:

- Homework must be stapled, be relatively neat, and have your name on it. It must be on separate paper, not on this paper (though you do not need to copy the question).
- Homework exercises must be done in order (if you skip an exercise, still write down the number and leave some blank space).

The Assignment

1. Perform the indicated operations and simplify.

(a) $\frac{-2}{5} - 4$

(b) $\frac{-2}{5} \cdot (-4)$

2. Consider the line: $2y - 6x + 2 = 0$

(a) Find the slope.

(b) Find x intercept and y intercept.

(c) Find a third point on the line (the x intercept and y intercept provide two points).

(d) Graph the line.

3. Solve the following equations.

(a) $6x + 8 = 12$

(b) $(3 - x)(x - 3)(x) = 0$

(c) $2(3 - x) = 4 - (2 + 6x)$

(d) $x^2 + 9x + 18 = 0$

(e) $5x - 20 = 0$

(f) $x^2 - 5x + 6 = 0$

(g) $x^2 = 12 - x$

(h) $5x^2 + 4 = 9x$

4. Do three things for each expression: 1) Determine when it is undefined? 2) Determine when it equals 0? 3) Simplify it.

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

(b) $\frac{(x+4)(x^2+1)}{(x^2-1)(x-5)}$

(c) $\frac{16(x+5)^2(x-3)}{12(x+2)^2(x+5)}$

(d) $\frac{x^2-4x-5}{x^2-5x}$

5. Let $f(x) = \frac{4(x-3)}{(x+5)(x^2+x-2)}$

(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 $f(x) = 0$.

6. Perform the operation and simplify.

$$(a) \frac{x+2}{x-3} \cdot \frac{x+1}{x+2}$$

$$(b) \frac{(x+4)(x+3)}{(x-2)(x-5)} \cdot \frac{(x+4)(x-5)}{(x+3)(x+5)}$$

$$(c) \frac{x^2+3x}{x^2-3x-4} \cdot \frac{(x-4)(x-5)}{x^2}$$

$$(d) \frac{72x-12x^2}{8x+32} \cdot \frac{x^2+10x+24}{36x^2-1}$$

$$(e) \frac{x+2}{x-1} \div \frac{x+2}{x+5}$$

$$(f) \frac{(x-3)(x+3)}{(x-7)(x-6)} \div \frac{(x-3)(x-5)}{(x-7)(x+5)}$$

$$(g) \frac{x^2+5x+6}{x^2+7x+12} \div \frac{x+2}{x^2+2x-3}$$

$$(h) \frac{y^2-9}{2y^2-6y} \div \frac{(2y-1)(y+3)}{4y^2-1}$$

$$(i) \frac{5x}{x-3} - \frac{15}{x-3}$$

$$(j) \frac{1}{x} - \frac{3x-2}{x+3}$$

$$(k) \frac{x-2}{x+3} + \frac{x+1}{x-2}$$

$$(l) \frac{5}{x+4} + \frac{3x-12}{x^2-16}$$

$$(m) \frac{2}{x+3} + 2$$

$$(n) \frac{5}{x^2+5x+6} + \frac{2}{x+2}$$

$$(o) \frac{x}{x-1} + \frac{1}{x+1} - \frac{2}{x^2-1}$$

7. Simplify

$$(a) \frac{\frac{1}{x} + \frac{1}{x^2}}{\frac{1}{x} - \frac{1}{x^2}}$$

$$(b) \frac{\frac{2}{x} + \frac{2}{y}}{\frac{1}{x^2} - \frac{1}{y^2}}$$

$$(c) \frac{4 + \frac{4}{x-5}}{\frac{1}{x-5} + \frac{x}{4}}$$

8. Solve the following equations.

$$(a) 1 - \frac{2}{x} = \frac{15}{x^2}$$

$$(b) \frac{2}{x+1} + \frac{1}{x-1} = \frac{1}{x^2-1}$$

$$(c) \frac{x-6}{x^2+3x-4} = \frac{2}{x+4} + \frac{7}{x-1}$$

$$(d) \frac{x}{x+4} = \frac{32}{x^2-16} + 5$$