

# HOMEWORK 3 - MATH 102

DUE DATE: Monday, October 2

INSTRUCTOR: George Voutsadakis

Read each problem **very carefully** before starting to solve it. Four out of the eight problems will be chosen at random and graded. Each problem graded is worth 3 points. It is necessary to show **all** your work. Correct answers without explanations are worth 0 points.

GOOD LUCK!!

1. Solve the absolute value-equations:

(a)  $3|2x + 1| + 7 = 19$

(b)  $|9x + 5| = |6x - 3|$

2. Solve, graph and write the solution set in interval notation:

(a)  $|5x - 10| + 3 < 12$

(b)  $|7 - 4x| - 5 \geq 3$

3. Find the  $x$ - and the  $y$ -intercepts of the equation  $2x - 3y = -12$  and then sketch the graph of the equation.

4. Sketch the graphs of the equations  $-\frac{2}{5}x = 4$  and  $5 - y = \frac{3}{2}$ .

5. Find the domains of the following functions:

(a)  $f(x) = \frac{x-4}{(x+3)(x-7)}$

(b)  $g(x) = \sqrt{7 - 3x}$

6. (a) Consider the function  $f(x) = \frac{x+7}{2x-1}$ . Find the values of the expressions  $f(2)$ ,  $f(3)$  and  $\frac{f(2)+f(3)}{8}$ .

(b) Consider the functions  $f = \{(1, 3), (-1, 5), (-3, 7), (-5, 9)\}$ ,  $g = \{(-2, 4), (0, 6), (2, 8), (4, 10)\}$ . Find the values of  $f(-3) - g(2)$  and  $\frac{f(-1)}{g(4)}$ .

7. (a) Determine whether the lines  $AB$  and  $CD$  are parallel, perpendicular or neither, if  $A(4, 3)$ ,  $B(-6, -2)$ ,  $C(-1, 11)$ ,  $D(5, -1)$ . Show all the details of your work.

(b) Determine  $x$  if you know that the line through  $A(x, 5)$  and  $B(-2, 3)$  is perpendicular to the line with slope  $\frac{2}{5}$ .

8. (a) Find the midpoint of the line segment  $AB$  joining  $A(-15, 7)$  and  $B(23, -4)$ .

(b) Find the slope and the  $y$ -intercept of the linear equation  $7y - 14x = -42$  and graph the equation.