HOMEWORK 4 - MATH 111

DUE DATE: Friday, October 4

INSTRUCTOR: George Voutsadakis

Read each problem very carefully before starting to solve it. Each question is worth 1 point. It is necessary to show your work. Correct answers without explanations are worth 0 points.

GOOD LUCK!!

1. Use the quadratic formula to solve $6x^2 - x - 2 = 0$. The solutions are
$$(a) \quad \frac{1}{2}, -\frac{2}{3} \quad (b) \quad \frac{1}{2}, \frac{3}{2} \quad (c) \quad -\frac{1}{2}, \frac{3}{2} \quad (d) \quad -\frac{1}{2}, \frac{2}{3}$$

2. Use the quadratic formula to solve the equation $10x^2 - 11x + 3 = 0$. The solutions are
$$(a) \quad \text{no solutions} \quad (b) \quad \frac{3}{5}, \frac{1}{2} \quad (c) \quad \frac{5}{3}, \frac{1}{2} \quad (d) \quad -\frac{3}{5}, -\frac{1}{2}$$

3. Solve the inequality $x^2 - 7x + 12 \geq 2$. The solution is
$$(a) \quad 2 < x < 5 \quad (b) \quad x < 1 \text{ or } x > 6 \quad (c) \quad x \leq 1 \text{ or } x \geq 6 \quad (d) \quad x \leq 2 \text{ or } x \geq 5$$

4. Solve the inequality $\frac{x-2}{x+3} \leq 0$. The solutions are
$$(a) \quad -3 \leq x < 2 \quad (b) \quad -3 \leq x \leq 2 \quad (c) \quad -3 < x \leq 2 \quad (d) \quad x < -3 \text{ or } x \geq 2$$

5. The domain of $f(x) = |x|$ is
$$(a) \quad \mathbb{R} \quad (b) \quad \{x : x \geq 0\} \quad (c) \quad \mathbb{R} - \{0\} \quad (d) \quad \{x : x > 0\}$$

6. The domain of $g(x) = \sqrt{\frac{x^2-2x+1}{x-3}}$ is
$$(a) \quad \{x : x \leq 1 \text{ or } x > 3\} \quad (b) \quad \{x : x \geq 3\} \quad (c) \quad \{x : x > 3\} \quad (d) \quad \mathbb{R} - \{3\}$$

7. Graph the piece-wise linear function
$$f(x) = \begin{cases} -x - 2, & \text{if } x \leq 2 \\ 2x + 3, & \text{if } x > 2 \end{cases}$$

8. Consider the function $g(x) = -x^2 + 8x - 15$. Its graph is a parabola. Find its vertex and x-intercepts, state whether it opens up or down and make a rough sketch of it.