

**MATH 101**  
**INTERM. ALGEBRA**

**NAME:**  
**ID#:**

**TAKE-HOME EXAM 6**  
(Chapter 12)

**Solve the following problems showing all your work for full credit.**

**1.** Show on a number line the solution set for each condition below.

a) (6 pts.)  $x \geq -5$  and  $x < 20$

b) (6 pts.)  $x \geq -5$  or  $x < 20$

**2.** Use algebra to solve each inequality.

a) (6 pts.)  $6 - 5x \geq 11$

b) (8 pts.)  $7 + x \leq 5 - (3x + 2)$

**3.** Write the solutions in set-builder notation and on the number line.

a) (6 pts.)  $5 \leq 20 - 3x$  and  $20 - 3x > 12$

b) (6 pts.)  $4x - 12 > -5$  or  $4x - 12 \leq -10$

4. Use a graph to find the solution sets. Write the solutions in set builder notation and on the number line.

a) (8 pts.)  $|x + 2| \leq 3$

b) (8 pts.)  $4x^2 \geq 20$

c) (8 pts.)  $0 < \frac{4}{x^2} < 1$

5. Graph the system of inequalities. Be sure to shade the region that represents the solution set.

a) (10 pts.) 
$$\begin{aligned} y &\leq 2x \\ y &< x - 3 \end{aligned}$$

b) (10 pts.) 
$$\begin{aligned} x - 3y &> 6 \\ x + y &\leq 1 \end{aligned}$$

6. After attending to their children needs, a couple decides to buy some M&Ms and Peppermint Patties. Because of the sugar, they decide to buy no more than 1 pound of candy. The sweet tooth decides there must be at least one-quarter pound of M&Ms and the Peppermint Patties must be less than twice the M&Ms. Let  $x$  be the pounds of M&Ms and  $y$  be the pounds of Peppermint Patties.

a) (8 pts.) Write a system of linear inequalities for this situation.

b) (10 pts.) Graph the system and shade the region of the solution set.