

**Math 105 - Homework 7**

Name: \_\_\_\_\_

*Solve all of the following without using a calculator.*

1.  $6 - x \geq 0$

2.  $-2u + 5 \leq 7$

3.  $7x + 5 > 12x - 6$

4.  $x^2 - 5x > 0$

5.  $x^2 + x - 20 > 0$

6.  $9 - x^2 \leq 0$

7.  $x^2 - 3x \leq -2$

8.  $\frac{1}{x} > \frac{2}{5}$  *Hint: notice that  $x = 0$  is a bad point.*

9.  $(x + 1)(x + 2)(x + 3) > 0$

10.  $7 \leq 2x - 3 \leq 15$

11.  $\frac{x(x + 5)(x - 7)}{(x - 2)^2} > 0$

12.  $\frac{r}{4 - r} \leq 1$

Rewrite the following sentences as inequality formulas using absolute values. You do not need to solve the inequalities.

13. The distance from  $x$  to 5 is less than 2.

14. The distance from  $y$  to  $-2$  is at least  $\epsilon$ , but strictly less than  $2\epsilon$ .

Find all solutions to the following equations and inequalities.

15.  $|x - 7| = 3$

16.  $|y - 3| < 4$

17.  $|3 - 2x| = 7$

18.  $|2x - 3| < 4$

19.  $|3 - z| \geq 2$

20.  $1 \leq |2x + 5| \leq 5$

Use the graphs below to solve the following inequalities without any algebra.

21.  $|x - 2| \leq 3$

22.  $3 + 2x - x^2 > x + 1$

