**Math 105 - Homework 8** **Name:** _____

*For each of the following equations you'll need to start by either factoring or expanding. Remember, you factor to solve when something is equal to zero. As always, show your work.*

1. $2x^2 - 7 = (x+1)^2$

2. $2x^2 - 7x + 3 = 0$

3. $\dfrac{(x+1)(x+5)}{x+2} = 4$

4. $\dfrac{x^2+6x+5}{x^2+4x+4} = 0$

5. $3x(x-5) - 4(x-5) = 0$

6. $\dfrac{3x}{x+2} = 5 - x$

*Solve the following inequalities without using a calculator.*

7. $6 - x \geq 0$

8. $-2u + 5 \leq 7$

9. $7x + 5 > 12x - 6$

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

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

12. $9 - x^2 \leq 0$

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

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

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

16. $7 \leq 2x - 3 \leq 15$

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

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