Math 105 - Homework 3 **Name:** _____

Simplify the following products by expanding. As always, show your work.

1. $3(x-4)$
2. $(x+y-2z)(-3x)$
3. $(x-2)(x+3)$
4. $(r-2)(4r-1)$
5. $(a-b)(a+b)$
6. $\dfrac{(3x-6)(x+1)}{3}$
7. $4(z-\frac{1}{2})(4z-2)$
8. $(a+b)(a^2-ab+b^2)$
9. $\frac{1}{2}(1-x)(2+2x)$

Factor the following expressions as completely as you can.

10. $10x+5$
11. $-15ab+6ac$
12. $3x^2+2xy$
13. $12xy^2-24x^2y$
14. $4x^2(x-1)-12x(x-1)$
15. $5y^2(y^2+3)-10y(y^2+3)$
16. $2\pi r^2+2\pi rh$
17. $\frac{1}{2}mv^2+mgh$
18. $2ab+3ac+a^2$

Simplify. Start by collecting the like terms.

19. $x + 2x + 3x + 4x^2 + 5x^2$

20. $\dfrac{3xy - 4x^2 - 7xy}{3x + 5x - 4x}$

Simplify each of the following expressions as much as you can.

21. $3u + 7 - \dfrac{24 - 16u}{8}$

22. $\dfrac{5x - 10y}{5} + \dfrac{4x + 8y}{x + 2y}$

23. $\dfrac{(4x^2 - x)(3x - 3)}{(x - 1)(4x - 1)}$

24. $\dfrac{\dfrac{(a + b)(a - b)}{2}}{\dfrac{a + b}{4}}$

Solve for x using factoring and/or distribution.

25. $xy - 2x = 4$

26. $Ax + Bx + Cx = 1$

27. $10(x + 5) + 2(x + 3) = 8$

28. $\dfrac{x}{y} + 4x = 3$