Alg 3A Finals

- 1. When asked to solve an equation:
  - -Try to factor first

-If it doesn't factor, complete the square or use quadratic equation.

2. "-" in the exponent means to make a fraction:  $x^{-2} \rightarrow \frac{1}{x^2}$ 

## 3. Factoring Patterns:

 $a^{3} - b^{3} = (a - b)(a^{2} + ab + b^{2})$   $a^{3} + b^{3} = (a + b)(a^{2} - ab + b^{2})$   $a^{2} - b^{2} = (a - b)(a + b)$  $a^{2} \pm 2ab + b^{2} = (a \pm b)^{2}$ 

**4. Case Problems or Domain problems:** Draw a number line, with all roots labeled, and check each section when finding the domain of a square root, or the signs in each case.

- 5. inumbers  $i = \sqrt{-1}$   $i^3 = -i$  $i^2 = -1$   $i^4 = 1$
- **6. Point Intercept Form:** y = mx + b
- 7. Rationalizing: If there is an "i" or root in denominator you must rationalize. Conjugate?
- **8. Exponents:**  $b^{\frac{p}{r}}$ ; p = power, r = root

**9. Exponent Rules:** Cannot distribute exponent if there is  $a + or - (x+2)^3 \neq x^3 + 8$  you must foil.

**10. Functions:** domain = x; range = y

**11. Quadratic Formula:**  $\frac{-b \pm \sqrt{b^2 - 4ac}}{2a}$ 

**12. Matrix Elimination:** When solving using matrix elimination, the important thing is to get 0's in the corner. Don't worry about 1's on the diagonal.

**13. i numbers** If there is an i in a denominator, rationalize.

**14. Parabolic form:**  $y = a(x-h)^2 + k$ 

## 15. Cramer's Rule

$$\mathbf{x} = \frac{\begin{vmatrix} \mathbf{c} & \mathbf{b} \\ \mathbf{f} & \mathbf{e} \end{vmatrix}}{\begin{vmatrix} \mathbf{a} & \mathbf{b} \\ \mathbf{d} & \mathbf{e} \end{vmatrix}}, \mathbf{y} = \frac{\begin{vmatrix} \mathbf{a} & \mathbf{c} \\ \mathbf{d} & \mathbf{f} \end{vmatrix}}{\begin{vmatrix} \mathbf{a} & \mathbf{b} \\ \mathbf{d} & \mathbf{e} \end{vmatrix}}$$

**16. Lines:** Horizontal line: slope = 0 Vertical line: no slope

**17. Absolute Value Equations**: If x is on the outside, (s/a | 3x - 4| = x - 3), check your answers.

- make sure absolute value is isolated before you solve your cases.

**18. Case Problems**: In case problems with a denominator,  $(s/a \frac{|3x-4|}{|x|} > 4)$ , get it out of the denominator and solve regularly.

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**19. Rationalizing other than a square root:**  $\frac{1}{\sqrt[4]{32xy^8z}}$ 

20. Perpendicular: Negative reciprocal slope

**21. Parallel:** same slope

22. Solving Fractional Equations: Make sure answer is not a restriction.

**23.** Solving Inequalities: Flip the sign when multiplying or dividing by a negative number.

**24. Domain**: If the problem is a radical, the number inside must be positive.

25. Graphing Inequalities: Finding the vertex