Math 4 Pre-Calculus
Lecture 3, Part 1

Homework:
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More Equation Types — 1.4, 1.6

Equations

There are many different categories of equations. Some of the types of equations covered in Chapter 1 are:

- **Linear Equations** example: $5(x-1)+2=-4(x+3)$ (see earlier notes)
- **Quadratic Equations** example: $(x-1)^2+2=11$ (see earlier notes)
- **Polynomial Equations** with a degree higher than two example: $x^3-4x^2-9x+36=0$
- **Absolute Value Equations** example: $2|5x+2|-1=5$
- **Equations with Rational Exponents** example: $y^{4/3}=-3y$
- **Equations with Radicals (2.5)** example: $\sqrt[3]{6-y^2}+5=0$ s
- **"Quadratic-like" Equations (2.5)** example: $2x^{1/3}-3y^{1/6}+1=0$

Polynomial Equations with a degree higher than two

To solve, get a zero on one side and factor or use the quadratic formula.

Solve.

1. $3x^3-4x^2-27x+36=0$

2. $15x^5-20x^4=6x^3-8x^2$

Absolute Value Equations

To solve, isolate the absolute value. Use the fact that if $b>0$ and $|a|=b$, then $a=b$ or $a=-b$. Do **NOT** distribute over an absolute value!

Solve.

3. $2|5x+2|-1=5$

Equations with Rational Exponents

To solve, try getting a zero on one side and factoring. Isolate the term with the rational exponent, than "undo' the rational exponent by raising both sides to the reciprocal of the power of the isolated variable. **Check your answer(s)!**

Solve.

4. $x^{2/5} = 2$

5. $y^{4/3} = -3y$

Equations with Radicals

To solve, isolate a radical term. Raise each side to the appropriate power to "undo" the rooting. Repeat if necessary. Make sure to FOIL when appropriate. **Check your answer(s)!**

Solve.

6. $\sqrt[3]{6 - y^2} + 5 = 0$

7. $\sqrt{2x - 3} - \sqrt{x + 7} + 2 = 0$

"Quadratic-like" Equations

To solve, get a zero on one side of the equation, in order to write it in the form:

$$a(\text{expression})^2 + b(\text{expression}) + c = 0, \text{ where } a \neq 0.$$

Factor or use the quadratic formula to solve. **Check your answer(s)** if the equation contained any roots or denominators with variables.

Solve.

8. $2x^4 - 10x^2 + 8 = 0$

9. $2x^{1/3} - 3x^{1/6} + 1 = 0$

10. $2y^{-2/3} - 7y^{-1/3} = 15$

11. $\sqrt{5\sqrt{x}} = \sqrt{2x - 3}$