Precalculus 115, section 1.1-1.4 Review of Basics

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Important note: This Lecture won't cover *everything* you will need from sections 1.1 through 1.4 – we'll only hit the highlights. Rely on your text for covering topics we don't cover.

section 1.1

What is a real number? What kinds of real numbers are there?

Examples A: Perform the following calculations.

1. $\left(5+\frac{1}{4}\right)\left(3-\frac{1}{6}\right)=$

2. $12 \div 4 * 3 =$

3. $15-6+9=$

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Examples B: Perform the following calculations.

1. $\frac{9+6}{4-1}-5*2^3+7=$

2. $\left|\frac{3-7}{7-3}\right|=$

section 1.2

Examples C: First write what each of the following means, then evaluate to a numeric result or simplify as much as possible.

1. $2^4 =$

2. $(2a)^4 =$

3. $2a^4 =$

4. $(-2)^4 =$

5. $-2^4 =$

Examples D: Evaluate each of the following.

1. $2^0 =$ Why?

2. $2^{-4} =$ Why?

3. $2^{1/2} =$ Why?

Examples E: First write what each of the following means, then use your result to state a corresponding property of exponents.

1. $2^3 * 2^4 =$

   exponent property:

2. $(2^3)^4 =$

   exponent property:

Examples F: Simplify each of the following, and explain why the two results are *not* the same.

1. $\sqrt[3]{x^3} =$

2. $\sqrt{x^2} =$

section 1.3

Example G: Evaluate $(x+2)^2$.

Example H: Factor $12x^2-7x-10$ by the "trial and error" method.

Example I: Factor x^3-x^2-x+1 by the "grouping" method.

Example H revisited: Factor $12x^2-7x-10$ by the "splitting the middle" method.

Example J: Factor $49x^2-16y^2$.

section 1.4

Example K: Simplify $\dfrac{x^2+6x+9}{x^2+x-6} \div \dfrac{x^2-9}{x^2-4}$, then state the restrictions on the domain.

Example L: Subtract $\frac{4}{x^2-4}-\frac{5}{x^2+x-6}$, then state the restrictions on the domain.

Example M: Subtract $\frac{1}{x+1}-\frac{x-1}{x+1}$, then state the restrictions on the domain.

Important note: The equal symbol, " = ", can only be used when two expressions are mathematically equivalent. It should *never* be used to indicate "the next step in the process"!

Example N: A student's algebra work shown below is wrong. Rewrite it so that it is technically correct.

$$2x+3=4x-5=-2x=-8=x=4$$