Math 118 Calculus Ia **Skills 5**

Due at the beginning of class Monday, October 31. Write your solutions on separate paper (no ragged edges, please) with multiple pages stapled. Have it ready to turn in at the beginning of class.

1. Use a common denominator to add or subtract the fractions.

a. $\dfrac{1}{c^2} + \dfrac{6}{a^2}$

b. $\dfrac{1}{(x+\Delta x)} - \dfrac{1}{x}$

c. $\dfrac{z}{z^2+9} + \dfrac{z+1}{z^2+10}$

d. $\dfrac{1}{\sqrt{x+h}} - \dfrac{1}{\sqrt{x}}$

2. Expand each of the powers, and combine like terms in the expansion.
(Yes, you've done these already. It should be getting routine now - this is practice for fluency.)
Note that each part helps with the next; you don't have to start from scratch each time.

a. $(z+\Delta z)^2$ b. $(z+\Delta z)^3$ c. $(z+\Delta z)^4$ d. $(z+\Delta z)^5$

3. Rewrite each expression without roots or fractions, by using negative and/or fractional exponents.

a. $\dfrac{1}{x^8}$ b. $\sqrt{x}$ c. $\dfrac{4}{x^2}$

d. $20\sqrt[3]{x+13}$ e. $\dfrac{1}{\sqrt[5]{x}}$ f. $\dfrac{\sqrt{x+1}}{\sqrt{x-1}}$

4. Rewrite each expresion without any negative or fractional exponents, by using roots and/or fractions.

a. x^{-15} b. $x^{1/3}$ c. $(7x+4)^{-6}$

d. $(7x+4)^{-1}$ e. $(6x^7 - 11x^3)^{1/3}$ f. $(z+18)^{10}(z+10)^{-4}$

g. $(x+1)^{1/5}(x-1)^{-1/4}$

References: Review and Exercises

1. Adding / Subtracting Fractions

   a. Khan Academy: Adding & subtracting rational expressions (A complete lesson with lectures and exercises. It begins talking about adding and subtracting with like denominators; you'll have to go on to unlike denominators as well.)

   b. IXL: Add and subtract rational expressions

2. Expanding powers / multiplying polynomials:

   a. IXL: Multiply Polynomials

   b. Khan Academy: Multiply Binomials by Polynomials

   c. Algebra Lab: Binomial Expansion (There are some missing images near the end of the page, but the first part about squares and cubes of binomials is very helpful.)

3. Negative and Fractional Exponents

   a. Khan Academy: Introduction to Rational exponents and Radicals (A complete lesson with lectures and practice exercises)

   b. IXL: Equivalent Expressions Involving Exponents

   c. More IXL: Algebra Skills Index all of B.3-B.9 and E.1-E.6 are good practice and review.