MTH 65 – Winter Term 2010
Test 2 – Given February 8 **N**ame _____

You may not use any sort of calculator on this test.

1. Completely expand and simplify each expression. Make sure that you lay out work in a manner consistent with that illustrated and discussed in class. This problem continues on page 2.

   a. Expand $(x+5)(x-2)$. (3 points)

   b. Expand $(x+y)(2x+4y)$. (3 points)

   c. Expand $(6m-1)^2$. (4 points)

   d. Expand $(x+2y)(x^2-xy+y^2)$. (5 points)

e. Expand $-3x^4 y\left(2x^7 y^8 - 1 + 3x^2 z^2\right)$. (4 points)

f. Expand $\left(xy + ab\right)\left(xy - ab\right)$. (4 points)

g. $\left(x^2 y + 4x\right)^2$. (4 points)

h. Expand $x^2\left(x^4 + 4\right)\left(x^4 - 4\right)$. (6 points)

2. Perform each division and completely simplify the result. Make sure that you lay out work in a manner consistent with that illustrated and discussed in class. (6 points each)

   a. Divide $\dfrac{12x^2y^2 + 6x^2y - 15xy^2}{3xy}$.

   b. Divide $\dfrac{30x^3 + 10x^2 - 5x}{-5x}$.

3. Completely simplify each exponential expression and write each result in its provided blank. Perform any necessary "middle steps" on your scratch paper. Make sure that each answer contains no negative exponents and that no arithmetic remains undone (e.g. replace 3^2 with 9). (1.5 points each)

   a. $\left(x^5\right)^4 =$ _____

   b. $-3x^{-1} =$ _____

   c. $m^{-3}m^8 =$ _____

   d. $\dfrac{y^7}{y^{10}} =$ _____

   e. $\dfrac{x}{x^{-2}} =$ _____

   f. $\left(w^{-2}\right)^{-1} =$ _____

   g. $-5^{-1} =$ _____

   h. $(-8)^0 =$ _____

4. Completely simplify each expression. To earn full credit your work must be presented in the manner discussed and illustrated during lecture. Remember, simplified expressions never contain negative exponents. This problem continues on page 5.

a. Simplify $\frac{20x^{0}}{4x^{-1}}$. (3 points)

b. Simplify $\frac{y^{-3}}{\left(y^{4}\right)^{2}}$. (3 points)

c. Simplify $\left(3x^{-1}\right)^{-2}$. (3 points)

d. Simplify $\left(x^{3}\right)^{5} \cdot x^{-7}$. (3 points)

e. Simplify $\frac{\left(x^{-2}y\right)^{-3}}{\left(x^{2}y^{-1}\right)^{3}}$. (5 points)

f. Simplify $\left(\frac{x^3 y^4 z^5}{x^{-3} y^{-4} z^{-5}}\right)^{-2}$. (5 points)

g. Simplify $\left(2x^{-3} y z^{-6}\right)\left(2x\right)^{-5}$. (5 points)

5. Consider the function $f\left(x\right) = x^2 + 2$

a. What are the values of $f\left(4\right)$ and $f\left(-4\right)$? (4 points)

b. What is the solution set to the equation $f\left(x\right) = 18$? (3 points)

6. Please answer each of the following questions. You ***do not*** need to answer using complete sentences. (1.5 points each)

   a. What is the degree of the polynomial term $7xy^5z^3$?

   b. What are the terms and their coefficients for the polynomial $-x^8 + 2xy - 3x + y$?

   c. What is the leading term of the polynomial $6 + 5x$?

   d. What is the degree of the polynomial $4x + 6x^2 - 8x^3$?

   e. What is a monomial? What is a trinomial?

   f. What is the conjugate of $xy - 4x$?