Concepts on New Material Final – Sp 12 M311

Solving Linear Equations in 2 Variables (§4.1-4.3 w/ Ch. 5.8 & 6.6 included)

Using all the steps in the process to solve

1) Simplify expression on left & expression on right by:
   a) Distributing
   b) Clearing if fractions/decimals
   c) Combining like terms
2) Use the addition property of equality to move all variables to one side
3) Use the addition property of equality to move all constants to the other side
4) Use the multiplication property of equality to remove the numeric coefficient
5) Check using evaluation of the original problem at the value obtained

Focus on Clearing Equations of Fractions

1) After distributing, find LCD of ALL terms on both the left & right
2) Multiply every term symbolically by the LCD
3) Cancel the denominator with LCD in each term
4) Multiply the numerator with the new value from canceling
5) No fractions should remain

Difference between equations & expressions

Equations can be solved & Expressions can only be simplified

Equations can be cleared & Expressions can not

Reminder that our equations could contain: Integers, Fractions & Decimals

Ex 1: Solve each of the following equations

a) $2(x + 3) + 5 = 3x - 5(x + 2)$ b) $0.05x = 1.05x - 0.9$

c) $\frac{1}{2}x = \frac{2}{3}$ d) $2x - \frac{3}{15} = 5x - \frac{7}{15}$

Ex 2: Check your answer to Ex 1 a)

Ex 3: Clear but don't solve $\frac{1}{2}(\frac{1}{2}x - 2) + \frac{2}{3} = \frac{1}{9}x - 1$

§4.4 & 4.5 Translation & Word Problems

Translation reviewed

See Ch. 1 for a Review

Translating an Algebraic Equation & Then Solving

Application Problems

Perimeter of a Rectangle w/ translation

P = 2length + 2width

Angles in a Triangle w/ translation

Angle 1 + Angle 2 + Angle 3 = 180º

Supplementary & Complementary Angle Problems w/ translation

Supplementary: Angle 1 + Angle 2 = 180º

Complementary: Angle 1 + Angle 2 = 90º

Number Problems w/ translation

Ex 4: Translate but don't solve

a) Twice the sum of x and 5 is the same as the difference of 9 and x.

b) The quotient of a number and three is 5 less than the product of 3 and the number.

Ex 5: Show set up, a formula and an equation that could be used to solve:

The length of a rectangle is one less than three times a number and the width is twice that number. If the perimeter of the rectangle is 58 inches, find the dimensions of the rectangle.

Ex 6: Show set up, a formula and an equation that could be used to solve:
The sun makes an angle with the western horizon that is 6º more than twice the angle that it makes with the eastern horizon. What is the angle with the eastern horizon?

§3.4 Multiplying Polynomials

Multiplying Monomials
- Product Rule $a^x \cdot a^y = a^{x+y}$

Multiplying Binomials
- Apply Distributive Property Twice – FOIL
  - First, Outside, Inside & Last
    - Outside & Inside Combine Like Terms when (ax + #)(bx + #)
- Multiplying Conjugates – $(x + a)(x – a) = x^2 – a^2$
  - Square the First – Square the Second
  - Remember Power Rule $(xy)^2 = x^2y^2$

Multiplying Binomials x Polynomials
- Larger distributive property & more like terms to combine
- Long multiplication idea to line up like terms
  - Applies adding polynomials in columns

Multiplying Binomial x Binomial x Binomial
- Make Sure to Associate 2 & Multiply – Then multiply that product by last

Ex 7: Simplify $(5x^3y^2)(-2x^5y^2)$

Ex 8: Multiply and simplify where possible

a) $5xy^3(2x^2y^2 – 3x^2y + 4xy^2 – 3)$
b) $(x + 3)(x – 5)$
c) $(3x + 1)(2x – 5)$
d) $(2x – 5)(2x + 5)$
e) $(x + 3)(x^2 – 5x + 3)$
f) $(x + 3)(x + 1)(x – 1)$

§3.5 GCF's

Review of finding a GCF for a number
- List ALL factors & find largest in common
- GCF isn't a BIG number – biggest is small number

GCF of variable terms
- Lowest exponent is GCF
- One term without variable – variable isn't GCF
- Checking to see if GCF
  1) Divide all terms by GCF & if divide evenly (no denom) then CF (common factor)
  2) Check all quotients to see if anything in common still to see if got Gcf (greatest)

Ex 9: Find the GCF of: $18x^3y^2z$, $32x^2y^3z^2$ & $24x^2yz^3$

§3.6 Introduction to Factoring

Factoring out a GCF from a polynomial
1) Find GCF of terms
2) Write GCF times polynomial
3) Polynomial is the quotient of each original term & the GCF
   - Use Quotient Rule – $a^x \div a^y = a^{x-y}$
   - Divide Numbers
   - Polynomial must have no denominators & no common factors
4) Check by multiplying out

Ex 10: Factor each of the following

a) $2x^3 + 5x - 9x$ b) $32x^2y - 18xy + 24y$

c) $2x(x + 1) + 5(x + 1)$

Scientific Notation

Multiplying by factors of 10 can be shown using exponential notation

Exponent is **positive** & indicates # of places to move a decimal to the **right**

Dividing by factors of 10 can also be shown

Exponent is **negative** & indicates # of places to move a decimal to the **left**

Ex 11: Write the following in standard form

a) 5.1×10^3 b) 2.3×10^{-5}

Chapter 9

Graphing in the Rectangular Coordinate System

Labeling Points in the Rectangular Coordinate System

Checking to see if an ordered pair is the solution to a linear equation in 2 variables

Finding solutions to linear equations in 2 variables

Ex 12: Plot the following ordered pairs in a rectangular coordinate system

a) (2, 5) b) (-3, 4) c) (-1, -2) d) (4, -4) e) (0, -3) f) (-1, 0)

Ex 13: See homework for labeling points with ordered pairs

Ex 14: Is (5, -2) a solution for $2x - 5y = 20$?

Ex 15: Finish the table of solutions for $5x - y = 10$

x	**y**
0	
	5
2	