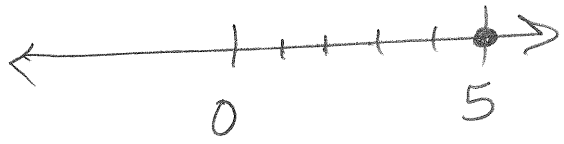
8/23/2012 - Chapter 1 Review (cont.)
Section 2.1

Graph 5



Operations
add, Subtract, multiply, divide

Parenthesis
Exponents PEMDAS
Multiply
divide
Add
Subtract

$6+3\cdot 5$

$6+15=\boxed{21}$

Properties of Real Numbers

Distributive Property

$a(b+c)=ab+ac$

$2(3+4)=2\cdot 7=14$

$2(3+4)$

$2\cdot 3+2\cdot 4$

$6+8$

14

Identities

Additive Identity is 0

$$a + 0 = a$$

Multiplicative Identity

$$a \cdot 1 = a$$

Inverse Properties

Additive

$$a + -a = 0$$

Ex: $5 + -5 = 0$

$-4 + 4 = 0$

Multiplicative

$$a \cdot \frac{1}{a} = 1$$

$$2 \cdot \frac{1}{2} = 1$$

$$\frac{1}{3} \cdot \frac{3}{1} = 1$$

Commutative Property

"Rearranging is Ok"

Addition

$a + b = b + a$

$3 + 5 = 5 + 3$

$8 \quad\quad 8$

Multiplication

$ab = ba$

$3 \cdot 5 = 5 \cdot 3$

$15 \quad\quad 15$

Not for Division

$8 \div 4 = 2$

$4 \div 8 \neq 2$

Associative Property

"Regrouping is OK"

Addition

$(a+b) + c = a + (b+c)$

Multiplication

$a(bc) = (ab)c$

Sec 2.1 Linear Equations in One Variable

Expression vs **Equation**

Expression: does not have an equal sign

Equation: has an equal sign

$3x + 2$ ← Expression

$4x + 3 = 5$ ← Equation

A Linear Equation in One Variable

- Linear: means variable is only raised to the 1st power
- Equation: has an equal sign
- One Variable: only have 1 an Known thing

Ex: $4x + 3 = 5$

~~$2x^2 + x + 3 = 0$~~

Not Linear

Properties of Equality

"What ever I do to one side Must be done to the other"

$A = B \rightarrow A + C = B + C$

$A = B \rightarrow AC = BC$

Solving Equations

Goal: get the Variable alone on one side

$2x + 4 = 5x - 11$

$-2x \quad\quad -2x$

$4 = 3x - 11$

$+11 \quad\quad +11$

$\frac{15}{3} = \frac{3x}{3}$

$5 = x$

$\{x = 5\}$

Steps to Solving

1. Clear fractions or decimals
2. Simplify each side seperately
3. Isolate the variable terms on one side
4. Isolate the Variable
5. Check your answer

Ex: $6 + -1(4 + x) = 8x - 2(3x + 5)$

$6 + -4 + -x = 8x - 6x - 10$

$2 - x = 2x - 10$

$-2 \quad -2x \quad -2x \quad -2$

$\frac{-3x}{-3} = \frac{-12}{-3}$

$x = 4$

$6 - (4 + x) = 8x - 2(3x + 5)$

$6 - (4 + 4) = 8(4) - 2(3 \cdot 4 + 5)$

$6 - 8 = 32 - 2(17)$

$6 - 8 = 32 - 34$

$-2 = -2$ ✓

Types of Answers we could get

1. Exactly 1
   from a conditional Equation
2. Lots and Lots of answers
   from an identity, means it's true for any value of x
3. None, no answer
   from a contradiction

Ex of identity

$$3\left(\frac{x+1}{3} + \frac{2x}{3}\right) = \left(x + \frac{1}{3}\right)3$$

$$(x+1) + 2x = 3x + 1$$

$$x + 1 + 2x = 3x + 1$$

$$3x + 1 = 3x + 1$$
$$-3x - 1 \quad -3x - 1$$

$0 = 0$ ← True Identity

$\mathbb{R}$ = all Real Numbers

contradiction end up with
$2 \neq 5$ answer $\emptyset$