

Review of Chapter 1

1.1 Graphing

- Understand how word problems translate to algebraic equations.
 The average yearly salary, w . Master's Degree is \$50,000 less than twice that of someone w. Bachelor's Degree.
 $y = 2x - 50,000$
- Determine ordered pairs that are solutions of equations.
 $y = 2x - 5$

x	y
-3	-11
-2	-9
-1	-7
0	-5
1	-3
2	-1
3	1
- Plot points of solution for an equation and sketch the graph of the equation.
 $y = x^2 - 4$

x	y
-3	+5
-2	0
-1	-3
0	-4
1	-3
2	0
3	+5
- Equations for horizontal lines: $y = k$.
 For vertical lines: $x = c$

Class Notes: Prof. G. Battaly, Westchester Community College, NY

College Algebra & Trig Home Page Homework

Review of Chapter 1

1.2 Linear Equations & Rational Equations

- Recognize equations as **linear** $ax + b = 0, a \neq 0$
- Solve linear equations using the **Addition Property of Equality** and the **Multiplication Property of Equality**

$$2(x - 1) + 3 = x - 3(x + 1)$$
- Solve rational equations using the **Multiplication Property of Equality**

$$\frac{3}{y+3} = \frac{5}{2x+6} + \frac{1}{x-2}$$

$$LCD = 2(x+3)(x-2)$$

$$x = -8$$
- Classify equations as **Conditional, Inconsistent, or Identities**

Conditional equation: Inconsistent equation:
 ■ has a finite number of solutions ■ has no solution
■ solution is empty set

Identity: ■ has a infinite number of solutions ie: true for all values of x

Class Notes: Prof. G. Battaly, Westchester Community College, NY

College Algebra & Trig Home Page Homework

Review of Chapter 1

1.3 Models & Applications

1. Translate word problems to algebra.

One number exceeds another by 24. let x = one number
 The sum of the two numbers is 58. $x + 24$ = other number
 Find the numbers. $x = 17$ one number $x + (x + 24) = 58$
 $x + 24 = 41$ other number

2. Solve word problems using a systematic

G: Discount pass for bridge \$30/mo.
 Bridge toll \$5, reduced to \$3.50 w. pass.
 F: # times bridge crossed/mo so that
 cost w. pass = cost w/o pass

let x = # bridge crossings		
	w/o pass	w/ pass
# of crossings	x	x
monthly charge	0	30
cost of crossing	$5x$	$3.50x$
total monthly cost	$5x$	$30 + 3.50x$

3. For equations with more than one variable, solve for one of the variables in terms of the other.

Used: let x = one number
 $x + 24$ = other number
 only 1 variable:
 have substituted $x+24$ for y

instead of
 x = one number
 y = other number
 2 variables

Review of Chapter 1 1.4 Complex Numbers

GOALS:

1. Define complex numbers as those that include negative radicals.

Define: Complex Number eg: $3 + 2i$
 $a + bi$ where a is real & bi is imaginary

2. Define $i = \sqrt{-1}$ and $i^2 = -1$

3. Perform operation of addition, subtraction, multiplication and division with complex numbers.

$(-2 + 6i) + (4 - i)$	$(-2 + 6i) - (4 - i)$
$2 + 5i$	$-6 + 7i$
$(-2 + 6i)(4 - i)$	$\frac{(-2 + 6i)}{(4 - i)}$
$10i + 26$	$\frac{17}{22} + \frac{17}{14}i =$

1.5 Quadratic Equations

GOALS:
Find Solutions to quadratic equations by:

- using Zero Product Principle

$$x^2 + 5x + 6 = 0$$

$$(x + 2)(x + 3) = 0$$

$$x + 2 = 0 \quad | \quad x + 3 = 0$$

$$x = -2 \quad | \quad x = -3$$

$$u v = 0$$

$$u = 0, v = 0$$

can solve
- using the Square Root Property

$$x^2 = 16$$

$$x = \pm\sqrt{16}$$

$$x = \pm 4$$
- Completing the Square

$$x^2 + 6x + 5 = 0$$

$$x^2 + 6x = -5$$

$$\left(\frac{b}{2}\right)^2 = \left(\frac{6}{2}\right)^2$$

$$x^2 + 6x + \underline{\quad} = -5 + \underline{\quad}$$

$$x^2 + 6x + \underline{9} = -5 + \underline{9} = 4$$

$$(x + 3)^2 = 4$$
- applying the Quadratic Formula

$$2x^2 - 4x - 1 = 0$$

$$ax^2 + bx + c = 0$$

$$x = \frac{-b \pm \sqrt{b^2 - 4ac}}{2a}$$

2 / 9 / 1 1

Class Notes: Prof. G. Battaly, Westchester Community College, NY
College Algebra & Trig Home Page Homework

1.6 Other Equations

GOALS:
Find Solutions to Other Equations:

- I. Polynomial Equations, higher order
factor (by grouping), try techn. for quadratics

$$5x^4 - 20x^2 = 0$$

$x = 2, -2, 0, -x, x = 0$
- II. Radical Equations

Simplify to the form $\sqrt{u} = v$ $\sqrt{20 - 8x} = x$

Square both sides $u = v^2$

Must check results

$x = 2, -2, x \neq 0$
- III. Equations in Quadratic Form

$$4x^4 = 13x^2 - 9$$

$x = \pm 3/2, x = \pm 1$
- IV. Equations with Absolute Value

If $|u| = c$ $|x - 2| = 9$

then $u = c$ or $u = -c$ $5|4x| - 9 = 16$

$x = 5/4, x = -5/4$

Class Notes: Prof. G. Battaly, Westchester Community College, NY
College Algebra & Trig Home Page Homework

1.7 Inequalities: Linear and Absolute Value

GOALS:

1. Recognize the verbs used in inequalities.

$>$ "is greater than" \geq "is greater than or equal to"

$<$ "is less than" \leq "is less than or equal to"

2. Recognize solutions to inequalities as those values of a variable that make the inequality true.

$x < 0$ 

$x - 1 \leq 11$ 

3. Solve inequalities using properties comparable to those used to solve equations:

* Addition Property of Inequality same as AP Equality

* Multiplication Property of Inequality. same as MP

Equality except: when multiply or divide by negative,
change verb: change $>$ to $<$; change $<$ to $>$

Class Notes: Prof. G. Battaly, Westchester Community College, NY

[College Algebra & Trig Home Page](#)

[Homework](#)