Algebra 1

Lesson 9.5

Factor $x^2 + bx + c$

Warm-Up

Factor each polynomial by finding the GCF

(a) $4y^3 - 8y$ $4y(y^2-2)$

(b) $25ab^3 + 5ab$ $5ab(5b^2+1)$

(c) $3x^2y - 12xy^3 + 6x^2y^2$ $3xy(x-4y^2+2xy)$

(d) $14xy^3 - 21xy^2 + 28x$ $7x(2y^3-3y^2+4)$

Example 1. Working Backward (Factoring) with Tables

$x^2 + 7x + 10$

	x	5
x	x^2	5x
2	2x	10

$(x+5)(x+2)$

(a) $x^2 + 3x - 28$

	x	7
x	x^2	7x
-4	-4x	-28

	x	
x		
		-28

$(x+7)(x-4)$

(b) $x^2 - 4x - 32$

	x	-8
x	x^2	-8x
+4	4x	-32

	x	
x		
		-32

$(x+4)(x-8)$

(c) $x^2 - 13x + 40$

	x	-8
x	x^2	-8x
-5	-5x	40

	x	
x		
		40

$(x-8)(x-5)$

Example 2. Looking at Patterns

$x^2 - 6x + 8$

Factors of 8	Sum of Factors
-4, -2	-6
-1, -8	-9

$(x-4)(x-2)$

(a) $x^2 - 4x - 5$ (b) $x^2 + 2x - 15$ (c) $x^2 - 11x + 30$ (d) $x^2 + 8x + 12$

Factors	Sum of Factors
-5, 1	-4

Factors	Sum of Factors
-5, 3	-2
5, -3	2

Factors	Sum of Factors
-10, -3	-13
-15, -2	-17
-5, -6	-11

Factors	Sum of Factors
1, 12	13
6, 2	8

$(x-5)(x+1)$ $(x+5)(x-3)$ $(x-5)(x-6)$ $(x+6)(x+2)$

Example 3. Solving by Factoring
Solve the equation.

(a) $x^2 - 2x - 8 = 0$

$(x+2)(x-4)=0$

$x+2=0$ or $x-4=0$

$-2\ -2$ $+4\ +4$

$x=-2$ or $x=4$

(b) $x^2 - x = 12$

$-12\ -12$

$x^2 - x - 12 = 0$

$(x-4)(x+3)=0$

$x=4$ or $x=-3$

(c) $x^2 + 1 = -2x$

$+2x\ +2x$

$x^2 + 2x + 1 = 0$

$(x+1)(x+1)=0$

$x+1=0$ or $x+1=0$

$-1\ -1$

$x=-1$ or $x=-1$

$x=-1$

(d) $x^2 + 6x + 10 = 2$

$-2\ -2$

$x^2 + 6x + 8 = 0$

$(x+4)(x+2)=0$

$x=-4$ or $x=-2$

Assignment
New: Pg. 586 #4 - 28 (evens)

Review:

Factor.

1. $4x^3 - 16x^2$
2. $3(x - 2) + (x - 2)(x + 1)$
3. $12x^4 - 15x^3 - 18x^5$

Solve.

4. $2x(x - 4) = 0$
5. $5x^2 - 25x = 0$
6. $3x^2 = 4x$