6-4

Factoring Quadratic Expressions

Objectives: I can factor quadratic expressions in standard form.

$3X$

Warm-Up

Factor the following:

1) $2x^2 - 8x$

$2x(x-4)$

2) $9a^3b^4 + 12ab^5$

$3ab^4(3a^2+4b)$

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

$(x+1)(5-x)$

4) Factor by grouping

$3x^2 + 3x + 4x + 4$

$3x(x+1) + 4(x+1)$

$(x+1)(3x+4)$

Expand

FACTORING

$(x+1)(x+3)$

$x^2 + 3x + x + 3$

$x^2 + 4x + 3$

DISTRIBUTED multiplied through

Factor the quadratic expression

$x^2 + 4x + 3$

$(x+1)(x+3)$

Panel 1:
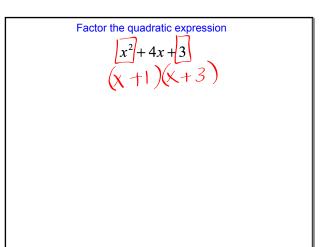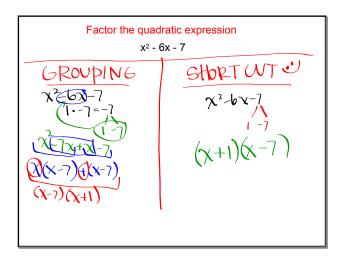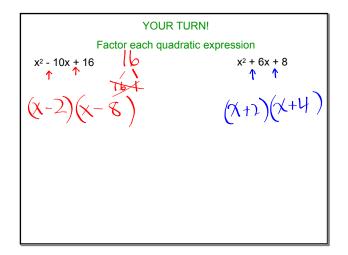
How to Factor a Quadratic

1. Factor out the GCF
2. Multiply a and c
3. Find two factors of ac that add to b

4. Re-write equation with b split up into factors
5. Find the GCF by grouping
6. Factor the GCF of the whole

Example:
$x^2 + 5x + 4$
1. GCF = 1
2. $1 \cdot 4 = 4$
3. 1, 4 or 2, 2
    1 + 4 = 5
    $x^2 + 5x + 4$
4. $x^2 + x + 4x + 4$
5. $x(x + 1) + 4(x+1)$
6. $(x + 1)(x + 4)$

Panel 2:

Factor the quadratic expression
$x^2 - 6x - 7$

GROUPING

$x^2 - 6x - 7$
$1 \cdot -7 = -7$
$1 \quad -7$
$x^2 - 7x + x - 7$
$x(x-7) + (x-7)$
$(x-7)(x+1)$

SHORT CUT ☺

$x^2 - 6x - 7$
$1 \quad -7$

$(x+1)(x-7)$

Panel 3:

Factor each quadratic expression

$56 + 10x - x^2$

56
4 14

35
7 5

$-x^2 + 10x + 56$

$(-x + 14)(x + 4)$

$35 - 12x + x^2$

$x^2 - 12x + 35$

$(x-7)(x-5)$

Panel 4:

YOUR TURN!
Factor each quadratic expression

$x^2 - 10x + 16$ 16

$(x-2)(x-8)$

$x^2 + 6x + 8$

$(x+2)(x+4)$

YOUR TURN!

Factor each quadratic expression

$3n^2 - 27n + 60$

$3(n^2 - 9n + 20)$

$3(n-4)(n-5)$

Factor each quadratic expression

$x^2 - 10x + 9$

$(x-1)(x-9)$ -9

$x^2 - 4x - 12$ -12

$3 \quad 4$

$(x-6)(x+2)$ $-6 +2$

$x^2 + 50x + 49$

$(x+1)(x+49)$

$x^2 + 6x - 16$

$(x+8)(x-2)$