Date:

Chp: Chp. 5:3 → Solving Quad. Eqs. by Factoring

Obj: · Write quad. eqs. in intercept form.
· Solve quad. eqs. by factoring

Notes:

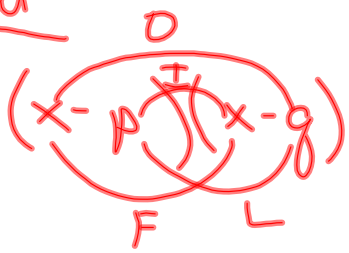
*Factored form = $0=a(x-p)(x-q)$

p & q are x-intercepts.

a = GCF

FOIL Method

F = First
O = Outer
I = Inner
L = Last



$x^2-xq-xp+pq$

OI

Factoring Techniques

1) GCF → $a^3b^2-nab^2=ab^2(a^2-n)$ (GCF; leftovers)

2) General Trinomials →

3.2 ~~$acx^2+(ad+bc)x+bd=(ax+b)(cx+d)$~~

$x^2+5x+6=(x+3)(x+2)$

3) Diff. of 2 Squares →

$a^2-b^2=(a+b)(a-b)$

$a^2-4=(a+2)(a-2)$

4) Perfect Square Trinomial

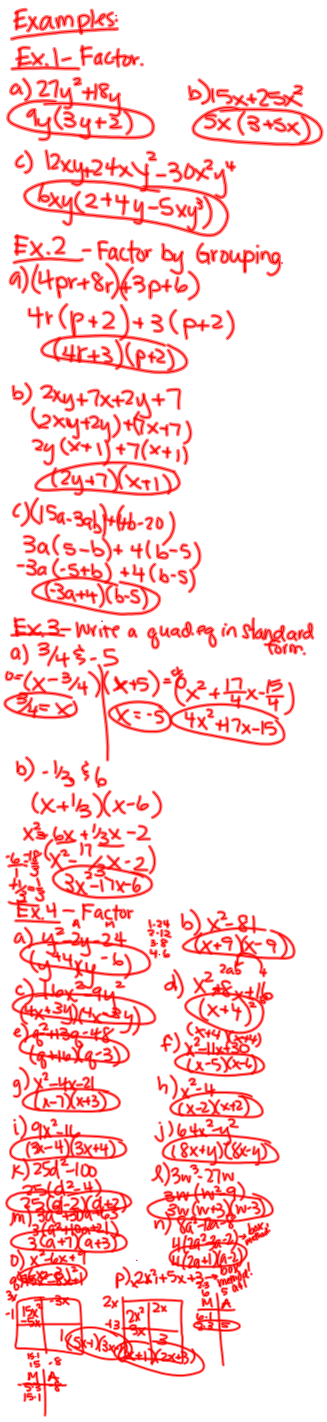
$a^2\pm 2ab+b^2=(a\pm b)^2$

$a^2\pm 2a(2)+2^2$

$a^2\pm 4a+4=(a\pm 2)^2$

Zero Product Prop.

If $a\cdot b=0$ then $a=0$, $b=0$, or both $=0$


Examples:
Ex.1- Factor.
a) 27y²+18y
9y(3y+2)
b) 15x+25x²
5x(3+5x)
c) 12xy+24xy²-30x²y⁴
6xy(2+4y-5xy³)
Ex.2 - Factor by Grouping
a) (4pr+8r)(3p+6)
4r(p+2)+3(p+2)
(4r+3)(p+2)
b) 2xy+7x+2y+7
(2xy+2y)+(7x+7)
2y(x+1)+7(x+1)
(2y+7)(x+1)
c) (15a-3ab)+(6b-20)
3a(5-b)+4(6-5)
-3a(-5+b)+4(b-5)
(-3a+4)(b-5)
Ex.3 - Write a quad eq in standard form.
a) 3/4 & -5
0=(x-3/4)(x+5)
3/4=x
x=-5
0=4x²+17x-15
4x²+17x-15
b) -1/3 & 6
(x+1/3)(x-6)
x²-6x+1/3x-2
x²-17/3x-2
3x-17x-6
Ex.4 - Factor
a) 4y²-2y-24
(4y-6)(y+4)
b) x²-81
(x+9)(x-9)
c) 16x²-9y²
(4x+3y)(4x-3y)
d) x²+8x+16
(x+4)(x+4)
e) a²+3a-48
(a+16)(a-3)
f) x²-11x+30
(x-5)(x-6)
g) x²-4x-21
(x-7)(x+3)
h) x²-4
(x-2)(x+2)
i) 9x²-16
(3x-4)(3x+4)
j) 64x²-y²
(8x+y)(8x-y)
k) 25a²-100
25(a²-4)
25(a-2)(a+2)
l) 3w³-27w
3w(w²-9)
3w(w+3)(w-3)
m) 3a²+18a+21
3(a²+6a+7)
3(a+1)(a+3)
n) 8y²-2y-3
4y(2y+1)(y-3/4)
4y(2y+1)(4y-3)
o) x²-6x+9
(x-3)(x-3)
p) 2x²+5x+3
(2x+1)(x+3)

Homework:

p. 272 (#17-19, 20-42 E, 79, 87)