

Date: 9/20/19

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

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

Notes:

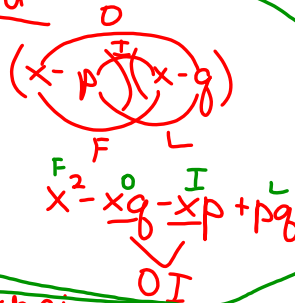
* Factored Form = $0 = a(x-p)(x-q)$

Ex: $2(x-3)(x+5)$ p & q are x-intercepts.
 $a = \text{GCF}$

might not exist
 #s - always have

FOIL Method

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



FP

Factoring Techniques

1) GCF → $a^3b^2 - nab^2 = ab^2(a^2 - n)$
 $\frac{a^3b^2}{ab^2} = a^2$, $\frac{nab^2}{ab^2} = n$, GCF leftovers

FP

2) General Trinomials →

$x^2 \pm bx + c$ $\frac{M}{A}$ $(x+z)(x+s)$
 $\frac{A}{M}$ $\frac{1 \cdot 10}{2 \cdot 5}$

3) Diff. of 2 Squares →

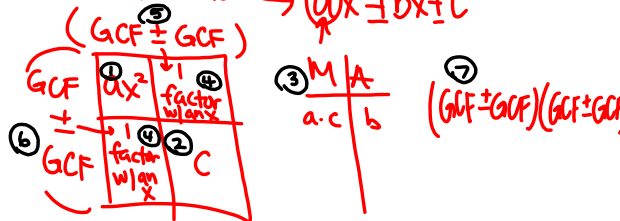
$a^2 - b^2 = (a+b)(a-b)$
 $a^2 - 4 = (a+2)(a-2)$

+c = same
 -c = diff.
 → look @ b to determine which same
 → look @ b to determine sign of bigger #

4) Perfect Square Trinomial

$a^2 \pm (2b)a + b^2 = (a \pm b)^2$
 $a^2 + 8a + 16 = (a+4)(a+4) \rightarrow (a+4)^2$

5) Box Method → $ax^2 \pm bx + c$



6) Factor by Grouping

$(8a^2 + 10ab^2) + (4ab + 5b^2)$
 $2a(4a + 5b) + b(4a + 5b)$
 $(2a + b)(4a + 5b)(4a + 5b)$

Zero Product Property

FP

For any \mathbb{R} # a & b , if $ab = 0$ then either $a = 0$, $b = 0$, or both = 0.

- Ex: $(x+3)(x-5) = 0$
 $0 =$
 $(-3 = x) \quad | \quad (x = 5)$

Examples:

Ex. 1 - Factor.

a) $21y^2 + 18y = 0$
 $3y(7y+6) = 0$
 $3y = 0$ or $7y+6 = 0$
 $y = 0$ or $y = -\frac{6}{7}$

b) $15x + 25x^2$
 $5x(3+5x)$

c) $12jk^2 + 6j^2k + 2j^3k^2$
 Pickers

d) $12xy + 24xy^2 - 36xy^3$
 Pickers

Ex. 2 - Factor.

a) $(4p+8)(3p+6)$
 $4(p+2) \cdot 3(p+2)$
 $12(p+2)^2$

b) $2xy + 7x + 2y + 7$
 $(2x+2y)(x+7)$
 $2y(x+1) + 7(x+1)$
 $(x+1)(2y+7)$

c) $15a^2 + 2ab + 4b + 20$
 Pickers

d) $(15a-3a)(4b-20)$
 $-3a(5+b) + 4(b-5)$
 $(-3a+4)(b-5)$

Ex. 3 - Write a quad. eq. in standard form.

a) $3x^2 - 5$

$0 = x^2 + 5x$
 $0 = x(x+5)$
 $x = 0$ or $x = -5$

b) $-x^2 + 6$

$0 = x^2 - 6x + 9$
 $0 = (x-3)^2$
 $x = 3$

Ex. 4 - Factor.

a) $y^2 - 2y - 24 = 0$
 $(y-6)(y+4) = 0$
 $y = 6$ or $y = -4$

b) $q^2 + 13q - 48 = 0$
 $(q-3)(q+16) = 0$
 $q = 3$ or $q = -16$

c) $x^2 - 11x + 30$
 $(x-5)(x-6)$

d) $x^2 - 4x - 21$
 $(x-7)(x+3)$

e) $2x^2 + 5x + 3$
 $(2x+3)(x+1)$

f) $15x^2 + 8x + 1$
 $(5x+1)(3x+1)$

g) $6y^2 - 23y + 20$
 Pickers

h) $x^2 - 49$
 $(x+7)(x-7)$

i) $x^2 - 81$
 Pickers

j) $9x^2 - 16$
 $(3x+4)(3x-4)$

k) $16v^2 - 9w^2$

l) $6x^2 - 4y^2$
 Pickers

m) $25d^2 - 100 = 0$
 $25(d^2 - 4) = 0$
 $(d-2)(d+2) = 0$
 $d = 2$ or $d = -2$

n) $3w^3 - 27w$
 Pickers

o) $3a^2 + 30a + 43$
 $(3a+1)(a+13)$

p) $8a^2 - 12a - 8$
 $4(2a^2 - 3a - 2)$
 $(2a+1)(a-2)$

q) $x^2 + 8x + 15$
 $x^2 - 10x + 25$
 $(x-5)(x-5)$
 $(x-5)^2$

r) $x^2 - 6x + 9$
 Pickers

s) $m^2 + 16m + 64$
 $(m+8)(m+8)$

$$\frac{1}{2}, -5$$

$$0 = \left(x - \frac{1}{2}\right)\left(x + 5\right)$$

$$\frac{1}{2} \cdot 0 = x^2 + 5x - \frac{1}{2}x - \frac{5}{2}$$

$$-\frac{1}{2} \cdot 5 = -\frac{5}{2} \cdot 0 = \left(x^2 + \frac{9}{2}x - \frac{5 \cdot 2}{2}\right) \cdot 2$$

$$0 = 2x^2 + 9x - 5$$

$$1.2 \quad 2m^2 - 9m - 18 \quad \begin{array}{l} 1 \cdot 18 \\ 2 \cdot 9 \\ 3 \cdot 6 \end{array}$$

	$2m + 3$	
m	$2m^2$	$3m$
6	$-12m$	-18

$$(2m+3)(m-6)$$

$$(2m+2)(m-9)$$

-36	-9
m	A
$1 \cdot 36$	
$2 \cdot 18$	
$3 \cdot 12$	
$4 \cdot 9$	
$6 \cdot 6$	

EX.1 - FOIL.

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

$$x^2 - \underline{5x} + \underline{3x} - 15$$

$$x^2 - 2x - 15$$

Homework:

WKS 5:3 (#2-8 E, 10-12, 14-26 E, 28-31)