Factoring Trinomials, in the form $1x^2 + bx + c$
pg. 20 #14

1) $x^2 - 7x + 10$

$(x - 5)(x - 2)$

Product = 10
Sum = −7

−5
−2

$-5 \times -2 = 10$
$-5 + (-2) = -7$

Check: $(x-5)(x-2)$
$x^2 - 5x - 2x + 10$
$-7x$

2) $y^2 - y - 12$

Product = −12 ⟨ +3, −4
Sum = −1 ⟨ +3, −4

$(y + 3)(y - 4)$

3) $5y^2 + 20y - 60$

Think GCF 1st!!

$5(1y^2 + 4y - 12)$

Sum Prod

Product = -12: +6, -2

Sum = +4: +6, -2

$5(y+6)(y-2)$

4) $x^4 + 99x^2 - 100$

S P

P = -100

S = 99

+100, -1

$(x^2+100)(x^2-1)$

DOS

cannot do!

$(x^2+100)(x-1)(x+1)$

5) $x^2 + 8xy + 15y^2$

middle S P

$(x + 5y)(x + 3y)$

5×3
$5 + 3$

x^2 $15y^2$

$3xy$
$5xy$

Factoring trinomials in the form

$ax^2 + bx + c$, where $a \neq 1$ pg 21-23

1) $2n^2 + n - 10$

Product $a \times c$

Sum b

product Sum Technique (youtube)

$2n^2 - 4n + 5n - 10$

Finish with Grouping Technique

Product $= -20$ (+5, -4)

Sum $= 1$

$2n(n-2) + 5(n-2)$

$(n-2)(2n+5)$

Check: FOIL

$(n-2)(2n+5)$

$2n^2 + n - 10$

* P/S Method will finish in grouping So Cool

2) $4a^2 + 33ab + 8b^2$

Product = 32 ± 32

Sum = 33 $+1$

$4a^2 + 32ab + 1ab + 8b^2$

$4a(a+8b) + b(a+8b)$

$(a+8b)(4a+b)$

3) $12x^2 + 44x + 24$

Think GCF 1st!

$4(3x^2 + 11x + 6)$

GCF $a \neq 1$

$P = 18$ $+9$ $+2$

$S = 11$

$4(3x^2 + 9x + 2x + 6)$

$4[3x(x+3) + 2(x+3)]$

$4[(x+3)(3x+2)]$

4) $7x^2 - 275x - 200$

$P = -1400$ -280 $+5$
$S = -275$

$7x^2 - 280x + 5x - 200$
$7x(x - 40) + 5(x - 40)$
$(x - 40)(7x + 5)$

Factoring Review

When factoring, you will have to analyze and decide which method to use. You will not be told the method.

Here's are a few directions:

1) Write the polynomial in descending order of degree.

2) Factor out the GCF, it there is one. Remember, if the leading term is negative, factor out the -1 GCF

3) Now factor the polynomial that remains:

a. If there are 4 terms, try to factor them by grouping.

b. If there are three terms (trinomial), try to use product/sum method. You may also watch for the perfect PST pattern.

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

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

c. If there are two terms (binomial), then there is no middle term, try to factor by DOS difference of squares.

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

4) Always check to see if anything factors further!!

5) If we can't factor anything, not even a GCF, then we call the polynomial prime.

This youtube shows the **summary of factoring**
https://youtu.be/vaDc46wt0eU

This youtube shows **examples of all kinds**
https://youtu.be/_VTO-gacCVo

Multi-Step Factoring

1) $6x(3x+4)+9x^2-16$

DOS

$6x(3x+4)+(3x-4)(3x+4)$

$(3x+4)[6x+(3x-4)]$

Simplify

$[3x+4][9x-4]$

Not DOS b/cuz x not x^2

2) x^3-25x

1st Step Think GCF

$x(x^2-25)$

DOS.

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

3) $(x^2-4)+(x-2)^2$

DOS

Write it out! It helps

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

$(x-2)[(x+2)+(x-2)]$

$2x(x-2)$

$(x-2)^2$

$(x^2-4x+4)^2$

$(x-2)^2$

$(x-2)^2$

4) Find the dimensions of a rectangular prism whose $V = 3x^3 + 9x^2 - 12x$

$V = 3x(x^2+3x-4)$

GCF

P/S

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

$p=-4$

$s=3$

The dimensions are $(3x)$, $(x+4)$, and $(x-1)$

5) Find the dimensions of a rectangular prism whose $V = x^3 - 3x^2 - 10x + 24$ and height is $(x - 2)$.

① ~~$x^2(x-3) - 2(5x-12)$~~ GROUPING

② Long DIVISION

$x^2 - x - 12 = (x+3)(x-4)$