MATH 11: UNIT 1.1 - Chp 1.1 (Mickelson): Factoring Quadratic Equations

A. Review of Math 10:
What is a quadratic equation?
-in Latin, 'quad' = 4, but 'quadra' is from 'quadratus' or 'quadrare' = make square

ie:

So: 'quadratic' = equation to the power of 2

-the word 'quadratic' was first used by John Wilkins (a clergyman and philosopher) for An Essay towards a Real Character and Philosophical Language (1668) in which, amongst other things, he proposed a universal language and a decimal system of measures which later developed to become the metric system.

B. Basic factoring:

i. Remove common factors

Ex: $5x^2+10$

Ex: $12x^4-8x^3+4x^2$

Ex: $x(x+1) +3(x+1)$

Ex: x^3+x^2+3x+3

ii) factoring ax^2+bx+c, a=1

….use after GCF, then 'criss cross', ac-method, break up the middle term, etc.

Criss-cross	AC-method	Break up the middle term
$X^2+7x+12$	$X^2+7x+12$	$X^2+7x+12$

Ex: x^2-x-12

Ex: $x^2-xy-12y^2$

Ex: x^2-7x+6

iii) difference of squares: $x^2-y^2 = (x-y)(x+y)$

Ex: $4x^2-16$

Ex: $(x^2-8x+16)-y^2$

Try and factor:

1) $3x^2+15x+12$

2) $x^2-7x-18$

3) $-x^3y-x^2y^2+6xy^3$

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

Do: Mickelson (2nd edition) pg 10 #5-8 (left), #11-14 (2 from each)
-quiz next day

Math 11: Unit 1.2
Factoring Quadratic Polynomials ax^2+bx+c

A. How do we factor ax^2+bx+c?
-after checking for GCF, we have a choice of methods:

i) we could do 'criss-cross':

ex: $-8x^2 + 10x + 12$

ii) we could do 'break-up the middle term':
ex: $-8x^2 + 10x + 12$

iii) we could do 'ac-method'
ex: $-8x^2 + 10x + 12$

…up to you what you prefer.

Try:

A. $4x^2 - 20x + 25$

B. $3x^2 + 11x - 42$

B. Special factors: perfect square trinomials
re: $a^2 + 2ab + b^2 = (a+b)^2$

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

-for it to be a perfect square, all these conditions MUST be met:
1) last term MUST be positive and a perfect square
2) 1st term MUST be positive and a perfect square
3) 2 x (square root of 1st term x square root of last term) = middle term

Ex: $x^2+10x+25$

ex: $64x^2 - 112x + 49$

WB pg 19 #1-4: left
#6-7: left
-quiz next day on unit 1.1 and 1.2

Math 11: unit 1.3 (chp 3.1) solving quadratic equations by factoring

A. What is a quadratic equation?

-it is a quadratic function set equal to zero
-we are solving for 'x'.
-if we are graphing quadratic equations, we want to see where the line will cross the 'x'-axis (covered later)

B. What is the 'general form' of a quadratic equation?

$ax^2 + bx + c = 0$ where a, b, and c are real numbers, and $a \neq 0$

ex: $-2x^2 - 6x - 4 = 0$

C. How to solve quadratic equations by factoring

ex: $x^2 - 9x + 20 = 0$

D. Solving rational equations…use lowest common denominator!

Ex:

Ex:

Ex:

WB pg 75 #6-9: left
#10, 14
-quiz next day: unit 1.1-1.3

MATH 11: UNIT 1.4 - (chp 3.2): square root property and completing the square

A. Why and when do we use it?

-not all quadratic equations can be easily solved by factoring.
ie: decimal/fraction answers
…therefore, need to do it algebraically

-not always the best way….just an option. Leave your answer in radical form.

B. How do we do the square root property?
-remember: 5 x 5 = 25 and (-5) (-5) = 25

-so when do doing square root of a number, we need to consider both the positive and negative roots

ie: 5 x 5 = 25 AND (-5) (-5) = 25 also!

Ex: $x^2 - 25 = 0$ $x^2 + 25 = 0$

Ex: $4x^2 - 36 = 0$ $(x-2)^2 - 49 = 0$

C. How to do completing the square?
-remember, a perfect square trinomial is: $(a+b)^2$

Ex:

Ex:

Ex:

…so let's try: $x^2 - 16x - 9 = 0$

Ex: $x^2 - 6x - 27=0$

Try: $x^2+6x+4=0$

Try: $x^2-4x-11=0$

C. What if $a\neq1$?

-make $a=1$, then do as usual.

Ex: $2x^2-5x-1=0$

-pg 81 #2-7: left
-handout: #1-13: odd
#27-43: odd

MATH 11: unit 1.5: QUADRATIC FORMULA

A. Why and when do we use it?

-short on time
-don't like 'completing the square'
- $Ax^2+Bx+C = 0$ doesn't factor easily

-use it to find roots of 'x'

B. What is it

From: $ax^2+bx+c = 0$ gives you:

And

C. How to do it?

Ex: $3x^2+5x-2=0$

Ex: $-0.2x^2+2.5x+8 = 0$

Note:

D. If given the answers for 'x', how do we find the original quadratic equation?

-pg 89 #3-8: pick 2 from each
-pg 97 #2: pick 5

-new handout #1-30: choose 15

-quiz/review/pretest/corrections/test