QUIZ

1. Expand and simplify -2(x - 3)(2x + 5)

$$= -2(2x^2 - x - 15)$$
$$= -4x^2 + 2x + 30$$

2. Fully factor each of the following:

a) $x^2 - 5x - 24$

$= (x-8)(x+3)$

b) $4x^2 - 12x - 16$

$= 4(x^2 - 3x - 4)$
$= 4(x-4)(x+1)$

c) $3x^2 - 12x - 16 + 4x$

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

$\dfrac{24}{}$
1,24
2,12
3,8
4,6

M -24
A -5
N -8,3

$\dfrac{-4}{}$
1,4
2,2

M -4
A -3
N -4, 1

4.5 Factoring Complex Trinomials

x^2 - x - 20   simple trinomial $a = 1$

$3x^2$ - 5x - 2   complex trinomial $a \neq 1$
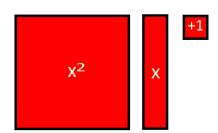
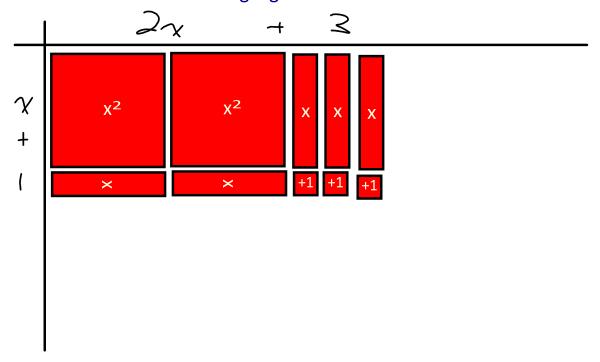**Always** common factor first!

Ex. 1 Fully factor $3x^2 + 3x - 6$

$= 3(x^2 + x - 2)$ M   -2

$= 3(x-1)(x+2)$ A   1

                         N   -1, 2

x^2　　　x　　　+1

Factor $2x^2 + 5x + 3$ using algebra tiles.

$2x$　　　　+　　　3

x
+
1

x^2　　　x^2　　　x　x　x

×　　　×　　　+1　+1　+1

Factoring by Decomposition

Expand $(2x-1)(3x+5)$

$$(2x-1)(3x+5)=6x^2+10x-3x-5$$
$$=6x^2+7x-5$$

Given $6x^2+7x-5$ you need a way of breaking up the middle term into 10x and -3x.

$$6x^2+7x-5$$
$$6x^2+10x-3x-5$$

-30

Use a M.A.N. table, but find the two numbers that:
Multiply to: A X C
Add to: B

Once you have found the 2 numbers you can factor:
- use the numbers to break up the middle term
- factor by grouping

$$6x^2+7x-5=6x^2+10x-3x-5$$
$$=2x(3x+5)-1(3x+5)$$
$$=(3x+5)(2x-1)$$

M $6(-5)=-30$
A 7
N $10,-3$

Ex. 2 Factor by decomposition

a) $12x^2 + 11x - 5$

$= 12x^2 - 4x + 15x - 5$
$= 4x(3x-1) + 5(3x-1)$
$= (3x-1)(4x+5)$

M −60
A 11
N −4,15

$\dfrac{60}{}$
1,60
2,30
3,20
4,15
5,12
6,10

b) $8x^2 - 2x - 3$

$= 8x^2 + 4x - 6x - 3$
$= 4x(2x+1) - 3(2x+1)$
$= (2x+1)(4x-3)$

M −24
A −2
N 4,−6

$\dfrac{24}{}$
1,24
2,12
3,8
4,6

c) $10x^2 - 17x + 3$

M 30
A −17
N −2,−15

$= 10x^2 - 15x - 2x + 3$
$= 5x(2x-3) - (2x-3)$
$= (2x-3)(5x-1)$

$\dfrac{30}{}$
1,30
2,15
3,10
5,6

d) $12 + 18d + 8d^2$

$= 2(6 + 9d + 4d^2)$

Not Possible

M 24
A 9
N

$\dfrac{24}{}$
1,24
2,12
3,8
4,6

FBUHL
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C1, 2cf, 4cdf, 5ace, 6acdf, 7c, 12, 13

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