Quiz...

Review:

(d) $5b - 4(2b+8)$

$5b - 8b - 32$

$= -3b - 32$

(e) $3a^2b^1(5a^1b^2 - 2ab) - 4ab^2(a^2 - 6a^2b)$

$15a^3b^3 - 6a^3b^2 - 4a^3b^2 + 24a^3b^3$

$= 39a^3b^3 - 10a^3b^2$

2. $(3x-5)(3x-5)$

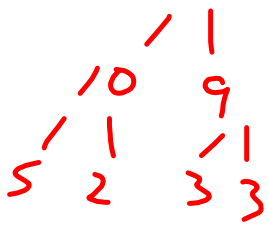
$9x^2 - 30x + 25 - (4x^2 - 3x + 28x - 21)$

$+ 4x^2 - 2x^2 + 12x +$

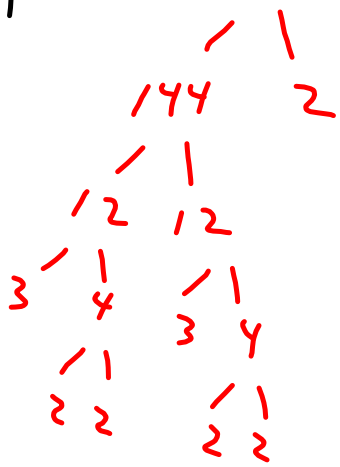
$7x^2 = 7x + x_2$

$= 2x^3 + 10x^2 - 50x + 88$

* 90 & 288



$= 5 \times 2 \times 3^2$



$= 2^5 \times 3^2$

Find GCF (18) & LCM (1440)

$GCF = 2^1 \times 3^2$

$= 18$

$LCM = 5 \times 2^5 \times 3^2$

$= 1440$

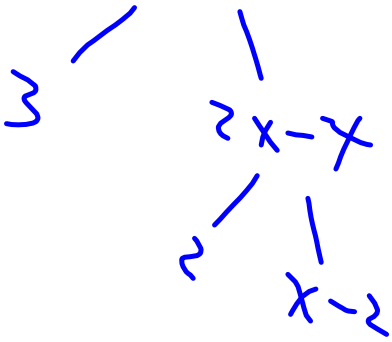
Factoring is the same as the process of PRIME FACTORIZATION...
Only it is done using algebra skills!!

$2x-4$
$2(x-2)$

Determine the prime factorization for each of the following...

32

$3(2x-4)$



Factoring

There are 5 different kinds of Factoring:

- **Greatest common factor (GCF)**
- **Factor by grouping ("Pair them up")**
- **Simple Trinomials (Factor by Inspection)**
- **Hard Trinomials (Factor by Decompostion)**
- **Special Factors**
  - **Difference of Squares**
  - **Perfect Square Trinomials**

Greatest Common Factor - there is a Greatest Common Factor amongst any number of terms in a polynomial

- factor out the GCF from the polynomial and multiply it against the remainder.

- sometimes the GCF may be a polynomial. ex: common binomial

EXAMPLES... Factor

1) $5x^2 + 25x^3 - 30x^4$ **2)** $36x^7y^4 - 16x^3y^5 - 24x^5y^3$ **3)** $9x(a - b) - 14y(a - b)$

$5x^2$ $5x^2$ $5x^2$

$5x^2(1 + 5x - 6x^2)$

2) $36x^7y^4 - 16x^3y^5 - 24x^5y^3$

$4x^3y^3$ $4x^3y^3$ $4x^3y^3$

$4x^3y^3(9x^4y - 4y^2 - 6x^2)$

$\frac{x^3}{x^3} = x^0 = 1$

extra: $30^3 - 9^7$

$30^3(1 - 30^4)$

3) $9x(a - b) - 14y(a - b)$

$(a - b)(9x - 14y)$

$9x \cdot \frac{a}{1} - 14y \cdot \frac{a}{1}$

$\frac{a}{1}(9x - 14y)$

EXERCISE: Factor each of the following...

1) $20x+15y-30z$

$5(4x+3y-6z)$

$12 = 6 \cdot 2$

$-3 = 1 \cdot -2$

2) $25x^7 - 50x^4$

$25x^4(x^3-2)$

3) $12x^3y^2 - 18xy$

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

4) $3x(2x-1)+5(2x-1)$

$2x+1$ $\quad 2x-1$

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

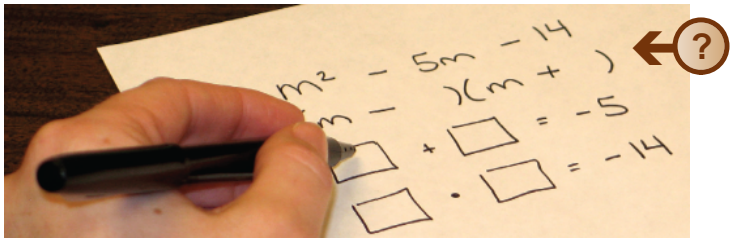
Simple Trinomials

Look at the numbers in the trinomial and the binomial.

$v^2 + 12v + 20 = (v + 2)(v + 10)$

12 is the sum of 2 and 10.

20 is the product of 2 and 10.



How could you complete this factorization?

3.5 Polynomials of the Form $x^2 + bx + c$

II. Factoring Trinomials:

Type 1: Polynomials of the form $x^2 + bx + c$

- Often referred to as "Simple Trinomials"

Expand each of the following:

(a) ~~$(w + 5)(w - 4)$~~ $w^2 + w - 20$

(b) $(x - 8)(x - 6)$ $x^2 - 14x + 48$

Expanding →

← Factoring

$1w^2 + 1w - 20$ $-4 + 5 = 1$

$(w - 4)(w + 5)$ $-4 \times 5 = -20$