# REASONING ABOUT FACTORING POLYNOMIALS

# QUIZ #10

- State the **greatest common factor** for each of the following. **(2 marks)**
  - $16w^4$ and $24w^3$ b. $15x^2y^3$ and $3x^3y^2$
- $8w^3$ $3x^2y^2$
- **Common factor** each of the following. **(4 marks)**
  - $4x^3 - 8x^2y$ b. $-12m^2 - 24m + 36$
- $= 4x^2(x - 2y)$ $-12(m^2 + 2m - 3)$
- 
- **Factor** each expression **by parts**. **(4 marks)**
  - $3a(b - 4) - 5(b - 4)$ b. $6xz + 10x - 3yz - 5y$
- $(3a - 5)(b - 4)$ $2x(3z + 5) - y(3z + 5)$

$(2x - y)(3z + 5)$

# QUIZ #10

4. **Factor** each of the following **trinomials**. **(4 marks)**

a. $x^2 - 10x + 24$

P: 24
S: −10

$= (x-6)(x-4)$

b. $x^2 + x - 12$

P: −12
S: +1

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

5. **Factor** each of the **special products**. **(3 marks)**

a. $1x^2 - 12x + 36$

$\sqrt{1} = 1$
$\sqrt{36} = 6$
$1 \times 6 \times 2 = 12$

$= (x-6)^2$

b. $9x^2 + 42x + 49$

$\sqrt{9} = 3$
$\sqrt{49} = 7$
$3 \times 7 \times 2 = 42$

$= (3x+7)^2$

c. $100x^2 - 121$

$\sqrt{100x^2} = 10x$
$\sqrt{121} = 11$

$= (10x+11)(10x-11)$

6. **Factor** the following by **first common factoring** and **then factoring the** resulting **trinomial**. **(3 marks)**

$4x^2 + 8x - 60$

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

P: −15
S: +2

$= 4(x+5)(x-3)$

# LEARNING GOAL

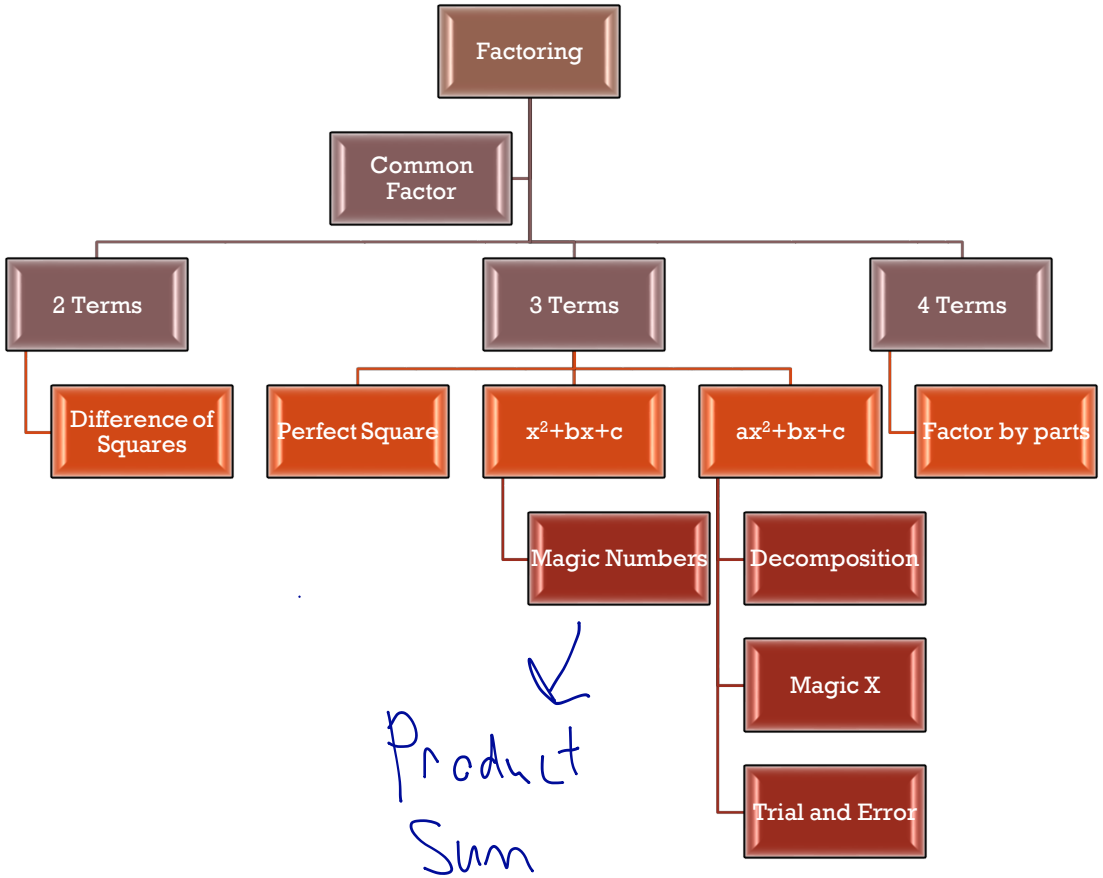
- Use reasoning to factor a variety of polynomials.

# MINDS ON...

- You are now factoring superstars, name the strategies you have learned to factor polynomials.

1. Common Factoring
2. Difference of Squares
3. Perfect Squares
4. Simple Trinomials — Product, Sum
5. Complex — Decomposition, Magic X, Trial & Error

# BIG IDEAS




Product
Sum

*Factor until you can't factor anymore!!*

# CONSOLIDATION

- Identify the type of algebraic expression and the factoring strategies you would use to factor the expression. Factor fully.

  $6xy + 12x^2y^2 - 4x^3y^3$

  $20x^2 + 11x - 3$

  $3x^2 + 3xa - 2x - 2a$

  $49y^2 - 9$

  $3x^2 - 3x - 90$

  $x^2 - 13x + 42$

$$6xy + 12x^2y^2 - 4x^3y^3$$

① Common Factors.

$2xy$

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

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

$$\boxed{-2xy(2x^2y^2 - 6xy - 3)}$$

decomposition or magic X

$a = 2$

$c = -3$

$(a)(c) = -6$

No numbers exist that multiply to $-6$ and add to $-6$

$20x^2 + 11x - 3$ - complex trinomial

$a = 20$
$c = -3$

$ac = -60$

Decomp. or Magic X

$20x^2 + 15x - 4x - 3$

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

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

| |
|---|
| $-1, 60$ |
| $1, -60$ |
| $2, -30$ |
| $-2, 30$ |
| $3, -20$ |
| $-3, 20$ |
| $4, -15$ |
| $-4, 15$ |

Magic X

$-60$

$\frac{-4}{20}$ $\frac{15}{20}$

$+11$

$\rightarrow$

$\frac{-1}{5}$ $\frac{3}{4}$

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

$$3x^2 + 3xa \mid -2x - 2a$$

$$3x(x+a) \quad -2(x+a)$$

$$= (3x-2)(x+a)$$

$$49y^2 - 9$$

$$\sqrt{49} = 7$$

$$\sqrt{9} = 3$$

$$= (7y+3)(7y-3)$$

$$3x^2 - 3x - 90$$

$$= 3(x^2 - x - 30)$$

P: $-30$

S: $-1$

$$= 3(x-6)(x+5)$$

$$x^2 - 13x + 42$$

P: 42

S: $-13$

$$= (x-7)(x-6)$$

# REINFORCEMENT

- Pages 236 – 237
  - #6 – 13, 16*

Quiz Tomorrow

Decomposition

Magic X