

# Factors and Products

## Key Ideas:

### 1. Prime Factorization

- used for GCF, LCM, perfect squares/cubes
- word problems

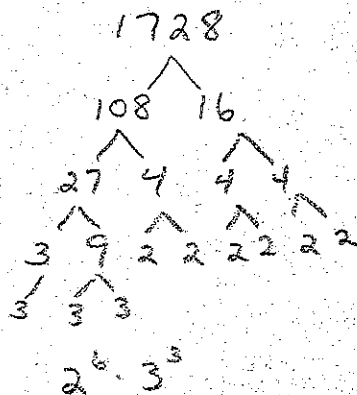
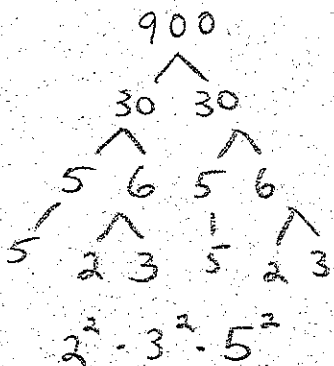
### 2. Factoring

- Common Factors
- PSF ("easy" and "hard")
- Difference of Squares

### 3. Multiplying Polynomials

**\*Note: Watch your positive and negative signs!! Always simplify!**

1. a) Write the **prime factorization** for the numbers 900 and 1728.



- b) Find the **GCF** of these numbers.

$$2 \cdot 2 \cdot 3 \cdot 3 = 36$$

- c) Find the **LCM** of these numbers.

$$2^6 \cdot 3^3 \cdot 5^2 = 43200$$

- d) Are these numbers **perfect squares or cubes**?

1728 is a perfect cube  $(2 \cdot 2 \cdot 3)(2 \cdot 2 \cdot 3)(2 \cdot 2 \cdot 3)$   
 900 is a perfect square  $(2 \cdot 3 \cdot 5)(2 \cdot 3 \cdot 5)$

2. Factor:  $3x^2y^5 - 12x^3y^3$

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

3. Factor:  $x^2 + 5x - 24$

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

4. Factor:  $6x^2 + 13x - 5$

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

p -30  
 s 13  
 f  $\frac{15}{3}$   $\frac{2}{2}$

5. Factor:  $100x^2 - 4y^4$

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

$$4(5x - y^2)(5x + y^2)$$

6. **Expand** each of the following:

a)  $(2x + 5)(7x - 3)$

$$14x^2 + 35x - 6x - 15$$

$$14x^2 + 29x - 15$$

b)  $(x - 8)^2$

$$(x - 8)(x - 8)$$

$$x^2 - 16x + 64$$

c)  $9 - (2x^2 - 3x + 5)(x^2 - 2x + 1)$

$$9 - (2x^4 - 4x^3 + 2x^2 - 3x^3 + 6x^2 - 3x + 5x^2 - 10x + 5)$$

$$9 - (2x^4 - 7x^3 + 13x^2 - 13x + 5)$$

$$9 - 2x^4 + 7x^3 - 13x^2 + 13x - 5$$

$$-2x^4 + 7x^3 - 13x^2 + 13x + 4$$