

6-1 Factoring Polynomials

Factors - the numbers that multiply together to equal a product

List the factors of the following:

$$6: 1 \times 6; 2 \times 3$$

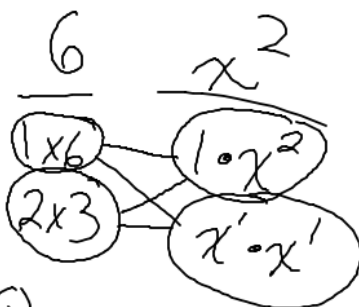
$$24: 1 \times 24; 2 \times 12; 3 \times 8; 4 \times 6$$

$$x^2: 1 \cdot x^2; x' \cdot x'$$

$$x^5: 1 \cdot x^5; x' \cdot x^4; x^2 \cdot x^3$$

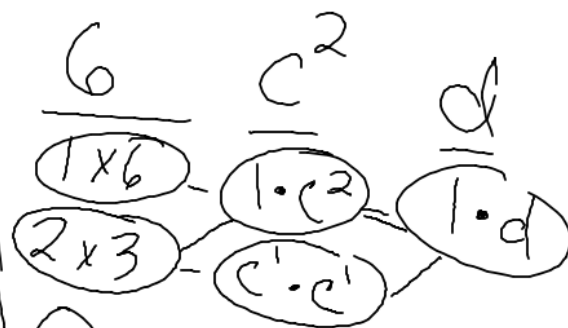
Find the factorizations of

$6x^2$



- ① $1 \cdot 6x^2$ ④ $3 \cdot 2x^2$
 ② $2x' \cdot 3x'$ ⑤ $x \cdot 6x'$
 ③ $2 \cdot 3x^2$

$6c^2d$



- ① $1 \cdot 6c^2d$ ③ $2 \cdot 3c^2d$
 ② $2c' \cdot 3cd$

When Factoring by GCF:

- 1.) Take the greatest common factor of each number
- 2.) Take the variable with the smallest exponent out
(Only if each term has that variable.)
- 3.) Divide Each term by the GCF and put GCF outside parentheses
- 4.) Put quotient in parentheses.

Factor:

$$\frac{5x^3 + 10}{5 \quad 5} \quad \text{GCF: } 5$$

$$5(x^3 + 2)$$

Check:

$$\begin{array}{l} 5(x^3 + 2) \\ 5x^3 + 10 \end{array}$$

$$\frac{6x^3 + 12x^2}{6x^2 \quad 6x^2} \quad \text{GCF: } 6x^2$$

$$6x^2(x + 2)$$

$$\text{Check: } 6x^3 + 12x^2$$

$$\text{GCF: } 4u^1v^2$$

$$\frac{12u^3v^2}{4u^1v^2} + \frac{16u^1v^4}{4u^1v^2}$$

$$4u^1v^2(3u^2 + 4v^2)$$

$$\text{GCF: } 6y^2$$

$$\frac{18y^4}{6y^2} - \frac{6y^3}{6y^2} + \frac{12y^2}{6y^2}$$

$$6y^2(3y^2 - y^1 + 2)$$