

• Properties of Exponents

$$\textcircled{1} \quad \overset{\text{red}}{x} \cdot \overset{\text{blue}}{x} \cdot \overset{\text{blue}}{x} \cdot \overset{\text{blue}}{x} \cdot \overset{\text{blue}}{x} = x^{2+4} = x^6$$

$$\textcircled{2} \quad \frac{x^5}{x^3} = x^{5-3} = x^2$$

$$\textcircled{3} \quad (x^5)^2 = x^{5 \cdot 2} = x^{10}$$

$$\textcircled{4} \quad (3x^4)^2 = 3^2 x^{4 \cdot 2} = 9x^8$$

$$\textcircled{5} \quad \left(\frac{x^3}{y^2} \right)^4 = \frac{x^{3 \cdot 4}}{y^{2 \cdot 4}} = \frac{x^{12}}{y^8}$$

$$\textcircled{6} \quad x^0 = 1$$

$$5^0 = 1$$

$$* 0^0 = 0$$

$$x^A \cdot x^B = x^{A+B}$$

$$\frac{x^A}{x^B} = x^{A-B}$$

$$(x^A)^B = x^{A \cdot B}$$

$$(x \cdot y)^A = x^A \cdot y^A$$

$$\left(\frac{x}{y} \right)^A = \frac{x^A}{y^A}$$

$\textcircled{7}$ Negative Exponents: to change a negative exponent into a positive exponent you must flip the term to the other part of the fraction

$$x^{-4} = \frac{1}{x^4}$$

$$\frac{2}{x^{-3}} = 2x^3$$

$$\frac{3x^{-1}}{2y^{-2}} = \frac{3y^2}{2x}$$

• Factoring

$\textcircled{1}$ Greatest Common Factor (GCF)

$$3x^3 - 6x^2 \rightarrow 3x^2(x - 2)$$

$$3x^3 - 6x^2 \rightarrow \underset{\text{GCF}}{3}x^2(x-2)$$

② Difference of Two Squares (DOTS)

$$\sqrt{9x^2} - \sqrt{16} \rightarrow (3x+4)(3x-4)$$

\downarrow \downarrow
 $3x$ 4

③ Trinomials $ax^2 + bx + c$

\uparrow \downarrow \downarrow
 $a=1$ add multiply

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

-1	10 = 9
1	-10 = -9
-2	5 = 3
2	-5 = -3

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