

October 1

Factor Using a GCF

Greatest Common Factor - largest term that can be divided out of EVERY term in the polynomial

(Ex1) Factor: $\frac{24x^4}{3x^2} - \frac{3x^3}{3x^2} + \frac{12x^2}{3x^2}$

$$\boxed{3x^2(8x^2 - 1x + 4)}$$

* Remember to put GCF in front!

$$\text{GCF: } 3x^2$$

* Use smallest exponent in GCF

(Ex2) Factor: $\frac{252a^7}{2a^4} + \frac{60a^6}{2a^4} - \frac{108a^4}{2a^4}$

$$\frac{126a^3}{2} + \frac{30a^2}{2} - \frac{54}{2}$$

$$\frac{63a^3}{3} + \frac{15a^2}{3} - \frac{27}{3}$$

$$\boxed{12a^4(21a^3 + 5a^2 - 9)}$$

$$\text{GCF: } 2a^4 \cdot 2 \cdot 3$$
$$12a^4$$

(Ex3) Factor: $\frac{14x^3y^2z}{x^2y} + \frac{7x^2yz}{x^2y} - \frac{1x^2y}{x^2y}$

$$\boxed{x^2y(14xyz + 7z - 1)}$$

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

Ex4 Factor: $\frac{-50p^2}{-10} + \frac{40}{-10}$

$$\boxed{-10(5p^2 - 4)}$$

GCF: -10

* GCF always matches sign of first term.

Factor Difference of Two Squares
 subtraction Perfect Squares
 2 terms 1, 4, 9, 16, 25, 36, 49, 64, 81, 100, ...

Ex5 Factor: $x^2 - 9$ no GCF!

$$\sqrt{x^2} = x \quad \sqrt{9} = 3$$

$$\boxed{(x+3)(x-3)}$$

Ex6 Factor: $16m^2 - 1$ no GCF!

$$\sqrt{16m^2} = 4m \quad \sqrt{1} = 1$$

$$\boxed{(4m+1)(4m-1)}$$

Ex7 Factor: $w^4 - 49$ no GCF!

$$\sqrt{w^4} = w^2 \quad \sqrt{49} = 7$$

$$\boxed{(w^2+7)(w^2-7)}$$

Ex8 Factor: $\frac{128k^2}{2} - \frac{50}{2}$ GCF: 2

$$2(64k^2 - 25)$$

$$\downarrow \sqrt{64k^2} = 8k \quad \sqrt{25} = 5$$

$$\boxed{2(8k+5)(8k-5)}$$