

Factor Out the GCF

Directions may just read: Factor Completely

1)  $20a^3 + 12a^2 + 28a$

$$\frac{\cancel{5} \cdot \cancel{4} \cdot a \cdot a \cdot a}{\cancel{4}a} + \frac{\cancel{3} \cdot \cancel{4} \cdot a \cdot a}{\cancel{4}a} + \frac{\cancel{7} \cdot \cancel{4} \cdot a}{\cancel{4}a}$$

$$4a[5a^2 + 3a + 7]$$

2)  $\frac{5 \cdot \cancel{10}x^{\cancel{6}^2}}{\cancel{2}x^{\cancel{4}^2}} + \frac{\cancel{9} \cdot \cancel{18}x^{\cancel{4}^2}}{\cancel{2}x^{\cancel{4}^2}}$

$$2x^4[5x^2 + 9]$$

3)  $\frac{\cancel{3}^3 \cdot \cancel{21}b^{\cancel{6}^3}c^{\cancel{4}^4}}{\cancel{7}b^{\cancel{3}^3}c} + \frac{\cancel{7}b^{\cancel{4}^4}c}{\cancel{7}b^{\cancel{3}^3}c} + \frac{\cancel{14}b^{\cancel{3}^3}c^{\cancel{2}^2}}{\cancel{7}b^{\cancel{3}^3}c}$

$$7b^3c[3b^3c^4 + b + 2c]$$

4)  $\frac{\cancel{2}^2 \cdot \cancel{10}x^{\cancel{6}^5}}{\cancel{5}x} - \frac{\cancel{4}^4 \cdot \cancel{20}x^{\cancel{4}^3}}{\cancel{5}x} + \frac{\cancel{3}^3 \cdot \cancel{15}x^{\cancel{2}^2}}{\cancel{5}x} - \frac{\cancel{1}^1 \cdot \cancel{5}x}{\cancel{5}x}$

$$5x[2x^5 - 4x^3 + 3x - 1]$$

Rules for Factoring:

1. GCF?

2. 2 terms?

3. 3 terms?

$$x^2 + 5x + 6$$

$$(x \quad )(x \quad )$$

5)  $\frac{4x^2}{4} + \frac{40x}{4} + \frac{84}{4}$

$$4[x^2 + 10x + 21]$$

21  
+ 1 - 21

$$4(x + 3)(x + 7)$$

+ 3 + 7

6)  $\frac{\cancel{3}^2 y^{\cancel{4}^2}}{\cancel{3}y^{\cancel{2}^2}} + \frac{\cancel{6}^2 y^{\cancel{3}^2}}{\cancel{3}y^{\cancel{2}^2}} - \frac{\cancel{15}^3 y^{\cancel{2}^2}}{\cancel{3}y^{\cancel{2}^2}}$

$$3y^2[y^2 + 2y - 15]$$

15  
+ 1 - 15

$$3y^2(y - 3)(y + 5)$$

- 3 + 5

$$7) \quad \frac{-5x^2}{-5} + \frac{40x}{-5} - \frac{60}{-5}$$

$$-5[x^2 - 8x + 12] \quad \begin{array}{r} 12 \\ \hline 1 \quad 12 \\ -2 \quad -6 \\ \hline 3 \quad 4 \end{array}$$

↙ sum ↘

$$\boxed{-5(x-2)(x-6)}$$

$$8) \quad x^2 + 11x + 18$$

$$\boxed{(x+2)(x+9)}$$

$$\begin{array}{r} 18 \\ \hline 1 \quad 18 \\ +2 \quad +9 \\ \hline 3 \quad 6 \end{array}$$

$$9) \quad x^2 + 11xy + 18y^2$$

$$\boxed{(x+2y)(x+9y)}$$

$$\begin{array}{r} 18 \\ \hline 1 \quad 18 \\ +2 \quad +9 \\ \hline 3 \quad 6 \end{array}$$

$$10) \quad x^2 + 7xy - 30y^2$$

$$\boxed{(x-3y)(x+10y)}$$

$$\begin{array}{r} 30 \\ \hline 1 \quad 30 \\ -2 \quad 15 \\ -3 \quad +10 \\ \hline 5 \quad 6 \end{array}$$