

1. Factor: $9x^4 + 18x^3 + 6x^2$

$$= \boxed{3x^2(3x^2 + 6x + 2)}$$

↑
GCF

2. Factor: $15x^4y^6 - 3x^3y^5 + 12x^4y^4$

$$= \boxed{3x^3y^4(5xy^2 - y + 4x)}$$

↑
GCF

3. Factor: $-5x^3 + 50x^2 - 10x$

$$= \boxed{-5x(x^2 - 10x + 2)}$$

↑
negative
GCF

4. Factor: $4y(a-b) - 1(a-b)$

$$= \boxed{(a-b)(4y-1)}$$

$$\leftarrow 4y(a-b) - 1(a-b)$$

5. Factor by grouping: $x^3 - 2x^2 + 5x - 10$

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

$$= \boxed{(x-2)(x^2+5)}$$

6. Factor by grouping: $xy - 5x + 9y - 45$

$$\begin{aligned} &= x(y-5) + 9(y-5) \\ &= \boxed{(y-5)(x+9)} \end{aligned}$$

7. Factor by grouping: $2x^3 - 10 + 4x^2 - 5x$

$$\begin{aligned} &= \underline{2x^3 + 4x^2} - \underline{5x - 10} \\ &= 2x^2(x+2) - 5(x+2) \\ &= \boxed{(x+2)(2x^2-5)} \end{aligned}$$

8. Factor by grouping: $x^3 - 2 + 3x^3y - 6y$

$$\begin{aligned} &= 1 \cdot (x^3 - 2) + 3y(x^3 - 2) \\ &= \boxed{(x^3 - 2)(1 + 3y)} \end{aligned}$$

Q: The more you take, the more you leave behind. What are they?