

Adding and Subtracting Polynomials

1. Look for like variables with identical exponents.
2. Add or subtract the coefficients (numbers in front of the variables)
3. Write final answer in descending order of powers

$$x^7 - x^5 + 12x^3 - x^4 + 2 \rightarrow \text{not in descending order}$$

$$x^7 - x^5 - x^4 + 12x^3 + 2$$

$$1) (8a - 4a^2) - (7a^3 - a)$$

$$8a - 4a^2 + \cancel{-7a^3} + a$$

$$\boxed{-7a^3 - 4a^2 + 9a}$$

$$2) (6a - 3a^2) + (2a^2 - 3a)$$

$$3a - a^2$$

$$\boxed{-a^2 + 3a}$$

$$3) (x^2 - x) + (8x - 2x^2)$$

$$\boxed{-x^2 + 7x}$$

$$4) (2a^2 + 4a^3) - (3a^3 + 8)$$

$$\cancel{2a^2} + \cancel{4a^3} + \cancel{-3a^3} - 8$$

$$\boxed{a^3 + 2a^2 - 8}$$

$$\overbrace{-1(4 + x^2)} \\ -4 - x^2$$

$$5) (5x^2 + 4) - (5 + 5x^3)$$

$$\cancel{5x^2} + 4 + \cancel{-5} - \cancel{5x^3}$$

$$\boxed{-5x^3 + 5x^2 - 1}$$

$$6) (\cancel{8n^2} - 2n^3) + (6n^3 - \cancel{8n^2})$$

$$\boxed{4n^3}$$

$$7) (8b^3 + 8) - (6 - 7b^3)$$

$$8b^3 + 8 + -6 + 7b^3$$

$$\boxed{15b^3 + 2}$$

$$8) (4x^3 - 6) + (5x^3 + 3)$$

$$\boxed{9x^3 - 3}$$

$$9) (10p^4 + 11) - (11p^4 + 13 + 16p^2)$$

$$\cancel{10p^4} + 11 + \cancel{-11p^4} - 13 - \cancel{16p^2}$$

$$\boxed{-p^4 - 16p^2 - 2}$$

$$\textcircled{10} (20v^2 - 9v^3) - (7v^3 - 10v^4 - 14v^2)$$

$$20v^2 - 9v^3 + 7v^3 + 10v^4 + 14v^2$$

$$\boxed{10v^4 - 16v^3 + 34v^2}$$

$$\textcircled{17} (11n + 7n^5 + 5) - (7n - 11n^5 + 6n^3) - (4 + 4n^5)$$

$$11n + 7n^5 + 5 + 7n + 11n^5 - 6n^3 + 4 - 4n^5$$

$$\boxed{14n^5 - 6n^3 + 4n + 1}$$

$$\textcircled{19} (\cancel{6k^5} - \cancel{6k^3} - \cancel{6k}) + (\cancel{4k} + \cancel{11k^4} - 11) + (\cancel{k^2} - 12)$$

$$6k^5 + 11k^4 - 6k^3 + k^2 - 2k - 23$$

$$\textcircled{23} (10 + 9v^5 - 8v^2) + (4v^4 + 3v^5 + 10) - (6 - 7v^4)$$

$$10 + \cancel{9v^5} - \cancel{8v^2} + \cancel{4v^4} + \cancel{3v^5} + 10 + -6 + \cancel{7v^4}$$

$$12v^5 + 11v^4 - 8v^2 + 14$$

$$\textcircled{20} (12x^4 + 3x^5 + 3x^2) - (6x - 5x^2 + 4) + (5x^5 + 7x)$$

$$\cancel{12x^4} + \cancel{3x^5} + \cancel{3x^2} + \cancel{-6x} + \cancel{5x^2} - 4 + \cancel{5x^5} + \cancel{7x}$$

$$\boxed{8x^5 + 12x^4 + 8x^2 + x - 4}$$