NAME _____ DATE _____

15-2 Adding Polynomials

Objective: To add polynomials.

Rule for Adding Polynomials
To add polynomials, combine like terms.

Example 1 Add: $(3x^2 - 2x + 1) + (x^2 - 5x + 4)$

Solution 1 Line up like terms vertically.

$$\begin{array}{r} 3x^2 - 2x + 1 \\ x^2 - 5x + 4 \\ \hline 4x^2 - 7x + 5 \end{array} \leftarrow \text{Combine like terms.}$$

Solution 2

$$\begin{aligned} &(3x^2 - 2x + 1) + (x^2 - 5x + 4) \\ &= (3x^2 + x^2) + (-2x - 5x) + (1 + 4) && \leftarrow \text{Group like terms.} \\ &= 4x^2 + (-7x) + 5 && \leftarrow \text{Combine like terms.} \\ &= 4x^2 - 7x + 5 \end{aligned}$$

Add.

1. $(2n^3 + 3n^2 + 4n + 5) + (6n^3 + n^2 + 3n + 2)$
2. $(5n^2 - 2) + (-3n^2 - 1)$
3. $(a^2 - 3a + 1) + (2a^2 - 4a - 5)$
4. $(w^2 - 9w - 3) + (-4w^2 + w + 8)$
5. $(2t^2 - 3t + 4) + (5t^2 - 6t - 7)$
6. $(5y^2 + 7y - 9) + (4y^2 - 6y - 8)$
7. $(3n^3 + 3n^2 + 3n + 3) + (4n^3 - 4n^2 - 4n - 4)$
8. $(x^3 + 3x^2 - 5x - 2) + (-x^3 + 8x^2 - 3x - 7)$
9. $(6t^2 - 3t + 7) + (-2t^2 - 5t + 2)$
10. $(3b^4 + 5b^3 + 2b^2 + 4b + 1) + (8b^4 + 6b^3 + 6b^2 + 8b + 2)$

Example 2 Add: $(8y^4 + y^3 + 8y + 4) + (y^4 - 9y^2 - 8y + 1)$

Solution Line up like terms vertically. Insert a zero term for each missing power.

$$\begin{array}{r} 8y^4 + y^3 + 0y^2 + 8y + 4 \\ y^4 + 0y^3 - 9y^2 - 8y + 1 \\ \hline 9y^4 + y^3 - 9y^2 + 0y + 5 \end{array} \quad \begin{array}{l} \leftarrow \text{There is no } y^2 \text{ term. Insert } 0y^2. \\ \leftarrow \text{There is no } y^3 \text{ term. Insert } 0y^3. \end{array}$$

The sum is written $9y^4 + y^3 - 9y^2 + 5$.

NAME _____ DATE _____

15-2 Adding Polynomials *(continued)*

Add.

11. $(2x^2 + 4x - 1) + (5x^3 + 3x - 4)$

12. $(3x - 7) + (x^2 - 4x + 6)$

13. $(6c^5 - 2c^4 + 3c^3 + c) + (-3c^5 - 2c^4 + 6c + 4)$

14. $(m^3 + 3m^2 - 5m) + (-3m^3 + 6m + 2)$

15. $(16w^3 - 18) + (18w^3 - 8w - 8)$

16. $(3x^4 + 5x^3 + x^2 + 1) + (2x^3 + 4x^2 + x + 6)$

17. $(2g^5 - 3g^3 + 6g - 4) + (2g^4 + 5g^3 - 2g^2 - g)$

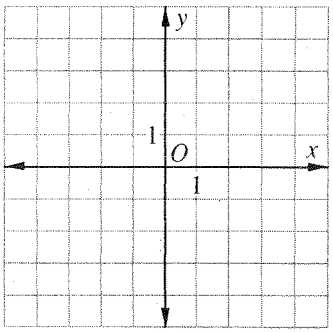
18. $(13z^3 - 2z - 3) + (12z^3 - 10)$

19. $(10p^4 - 12p^2 - 5) + (8p^3 - 6p)$

20. $(5q^4 - 3q^2 - 9q) + (7q^3 - 1)$

Spiral Review

21. Graph $y = 3x + 2$ on the coordinate plane at the right. *(Lesson 13-2)*



22. Find the surface area of a cube whose edge is 6 cm. *(Lesson 14-2)*

23. Add: $(5x^3 + 2x^2 - 4x + 11) + (3x^4 - 5x^2 + 7x - 7)$ *(Lesson 15-2)*

24. Make a stem-and-leaf plot for the given data. *(Lesson 11-2)*

Number of Free Throws in Basketball Games

28	19	23	35	41	38	23	40	29	35