

Name Schlansky
Mr. Schlansky

Date _____
Algebra 2

Operations with Polynomials

1. Express $(x^2 - 5x - 2) + (-6x^2 - 7x - 3)$ in simplest terms.

$$-x^2 - 12x - 5$$

2. Express $(3x^2 - 8x + 1) + (2x^2 - 3x + 5)$ in simplest terms.

$$5x^2 - 11x + 6$$

3. Express $(-2x^2 + 5x - 7) - (7x^2 - 3x + 2)$ in simplest terms.

$$\begin{aligned} &-2x^2 + 5x - 7 - 7x^2 + 3x - 2 \\ &-9x^2 + 8x - 9 \end{aligned}$$

4. Express $(7x^2 + 2x + 1) - (2x^2 - 3x - 5)$ in simplest terms.

$$\begin{aligned} &7x^2 + 2x + 1 - 2x^2 + 3x + 5 \\ &5x^2 + 5x + 6 \end{aligned}$$

5. What is the result when $5m^2 + 3m - 1$ is subtracted from $7m^2 - 5m + 1$?

$$\begin{aligned} &(7m^2 - 5m + 1) - (5m^2 + 3m - 1) \\ &7m^2 - 5m - 1 - 5m^2 - 3m + 1 \\ &2m^2 - 8m \end{aligned}$$

6. What is the result when $7xy + 5y - 2x$ is subtracted from $9xy - 5y + 3x$?

$$(9xy - 5y + 3x) - (7xy + 5y - 2x)$$

$$\cancel{9xy} - \cancel{5y} + \cancel{3x} - \cancel{7xy} - \cancel{5y} + \cancel{2x}$$

$$2xy - 10y + 5x$$

Express the following in simplest terms

7. $\frac{12x^3 - 6x^2 + 2x}{2x}$

$$6x^2 - 3x + 1$$

8. $\frac{8x^5 - 2x^4 + 4x^3 - 6x^2}{2x^2}$

$$4x^3 - x^2 + 2x - 3$$

9. $-3x(x-4) - 2x(x+3)$

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

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

10. $-3x^2y(5xy^2 + xy)$

$$-15x^3y^3 - 3x^3y^2$$

11. $(x-4)(x+6)$

$$\begin{array}{r} x \quad -4 \\ \times \quad \boxed{x^2} \quad \boxed{-4x} \\ \hline 6 \quad \boxed{6x} \quad \boxed{-24} \\ \hline x^2 + 2x - 24 \end{array}$$

12. $(2x-3)(3x+1)$

$$\begin{array}{r} 2x \quad -3 \\ \times \quad \boxed{6x^2} \quad \boxed{-9x} \\ \hline +1 \quad \boxed{4x} \quad \boxed{-3} \\ \hline 6x^2 - 7x - 3 \end{array}$$

13. $(x^2 + 2x - 4)(x+3)$

$$\begin{array}{r} x^2 \quad +2x \quad -4 \\ \times \quad \boxed{x^3} \quad \boxed{+2x^2} \quad \boxed{-4x} \\ \hline +3 \quad \boxed{3x^2} \quad \boxed{+6x} \quad \boxed{-12} \\ \hline x^3 + 5x^2 + 2x - 12 \end{array}$$

14. $(2x^2 + 3x - 2)(x-2)$

$$\begin{array}{r} 2x^2 \quad +3x \quad -2 \\ \times \quad \boxed{2x^3} \quad \boxed{+3x^2} \quad \boxed{-2x} \\ \hline -2 \quad \boxed{4x^2} \quad \boxed{-6x} \quad \boxed{+4} \\ \hline 2x^3 - x^2 - 8x + 4 \end{array}$$

15. $(3x^2 + x - 5)(x - 4)$

$$\begin{array}{r} 3x^2 + x - 5 \\ \times | 3x^3 \quad x^2 \quad -5x \\ \hline -4 | \cancel{3x^3} \quad \cancel{x^2} \quad \cancel{-5x} \\ \hline 3x^3 - 11x^2 - 9x + 20 \end{array}$$

17. $(4x^2 + 2x + 3)(x - 2)$

$$\begin{array}{r} 4x^2 + 2x + 3 \\ \times | 4x^3 \quad 2x^2 \quad 3x \\ \hline -2 | \cancel{4x^3} \quad \cancel{2x^2} \quad \cancel{3x} \\ \hline 4x^3 - 6x^2 - x - 6 \end{array}$$

19. $(m+7)^2$

$$\begin{array}{r} (m+7)(m+7) \\ m+7 \\ \times | m^2 \quad +7m \quad m^2 + 14m + 49 \\ \hline +7 | \cancel{m^2} \quad \cancel{+7m} \quad +49 \end{array}$$

21. $(x-9)^2$

$$\begin{array}{r} (x-9)(x-9) \\ x-9 \\ \times | x^2 \quad -9x \quad x^2 - 18x + 81 \\ \hline -9 | \cancel{x^2} \quad \cancel{-9x} \quad +81 \end{array}$$

23. $(2x-3)^2$

$$\begin{array}{r} (2x-3)(2x-3) \\ 2x-3 \\ \times | 4x^2 \quad -6x \quad 4x^2 - 12x + 9 \\ \hline -3 | \cancel{4x^2} \quad \cancel{-6x} \quad +9 \end{array}$$

16. $(2y^2 - 3y - 1)(y + 7)$

$$\begin{array}{r} 2y^2 - 3y - 1 \\ \times | 2y^3 \quad 3y^2 \quad -y \\ \hline +7 | \cancel{2y^3} \quad \cancel{3y^2} \quad \cancel{-y} \\ \hline 2y^3 + 11y^2 - 22y - 7 \end{array}$$

18. $(-5x^2 - 4x + 1)(2x + 5)$

$$\begin{array}{r} -5x^2 - 4x + 1 \\ \times | -10x^3 \quad -8x^2 \quad +2x \\ \hline +5 | \cancel{-10x^3} \quad \cancel{-8x^2} \quad \cancel{+2x} \\ \hline -10x^3 - 33x^2 - 18x + 5 \end{array}$$

20. $(y-4)^2$

$$\begin{array}{r} (y-4)(y-4) \\ y-4 \\ \times | y^2 \quad -4y \quad y^2 - 8y + 16 \\ \hline -4 | \cancel{y^2} \quad \cancel{-4y} \quad +16 \end{array}$$

22. $(z+2)^2$

$$\begin{array}{r} (z+2)(z+2) \\ z+2 \\ \times | z^2 \quad +2z \quad z^2 + 4z + 4 \\ \hline +2 | \cancel{z^2} \quad \cancel{+2z} \quad +4 \end{array}$$

24. $(4x+2)^2$

$$\begin{array}{r} (4x+2)(4x+2) \\ 4x+2 \\ \times | 16x^2 \quad 8x \quad 16x^2 + 16x + 4 \\ \hline +2 | \cancel{16x^2} \quad \cancel{8x} \quad +4 \end{array}$$