

Operations with Monomials and Polynomials Review

Simplify each problem.

1. $(x^2 + 5x - 24) + (-x^2 - 4x + 9)$
 $x - 15$

2. $(x^3 + x^2 - 5) + (-2x^2 + 9)$
 $x^3 - x^2 + 4$

3. $(4x^2 + 2x - 3) - (2x^2 - 5x - 3)$
 $2x^2 + 7x$

4. $(5x^2 - 6x + 3) - (2x^2 - 9x - 6)$
 $3x^2 + 3x + 9$

5. $x^5 \cdot x^2$
 x^7

6. $(x^2)^3$
 x^6

7. $(2x^2y^4)^3$
 $8x^6y^{12}$

8. $(-3xy^3)^4$
 $81x^4y^{12}$

9. $(-5x^2y^3)(-2xy^2)$
 $10x^3y^5$

10. $\frac{-18x^3y^2}{-6x^2y}$
 $3xy$

11. $\frac{6x^4y^5z}{30x^2y^8}$
 $\frac{x^2z}{5y^3}$

12. $(8x^5 - 6x^4) \div (2x^2)$
 $\frac{8x^5 - 6x^4}{2x^2}$
 $4x^3 - 3x^2$

13. $\frac{24x^3y^4 - 18x^2y^2 - 6xy}{-6xy}$
 $-4x^2y^3 + 3xy + 1$

14. $(3xy^2 - 4x^2y)(xy)^{-1}$
 $\frac{3xy^2 - 4x^2y}{xy}$
 $3y - 4x$

15. $(3x - 4)(4x + 5)$
 $12x^2 + 15x - 16x - 20$
 $12x^2 - 1x - 20$

16. $(4x - 2)^2$
 $(4x - 2)(4x - 2)$
 $16x^2 - 16x + 4$

$$17. \frac{(3x^{-2}y^3)(5xy^{-8})}{(x^{-3})^4y^{-2}}$$

$$\frac{(3x^{-2}y^3)(5xy^{-2})}{x^{-12}y^{-2}}$$

$$\frac{15x^{-1}y^{-5}}{x^{-12}y^{-2}} = 15x^{11}y^{-3}$$

$$\boxed{\frac{15x^{11}}{y^3}}$$

$$19. (3x^3 + 7x^2 - 4x + 3) \div (x + 3)$$

$$\begin{array}{r} -3 \overline{) 3 \quad 7 \quad -4 \quad 3} \\ \underline{-9 \quad 6 \quad -6} \\ 3 \quad -2 \quad 2 \quad \underline{-3} \end{array}$$

$$3x^2 - 2x + 2 - \frac{3}{x+3}$$

$$21. (x^4 - 3x^3 + 5x - 6) \div (x + 2)$$

$$\begin{array}{r} -2 \overline{) 1 \quad -3 \quad 0 \quad 5 \quad -6} \\ \underline{-2 \quad 10 \quad -20 \quad 30} \\ 1 \quad -5 \quad 10 \quad -15 \quad \underline{24} \end{array}$$

$$x^3 - 5x^2 + 10x - 15 + \frac{24}{x+2}$$

$$18. (x + 2)(x^2 + 3x + 4)$$

$$x^3 + 3x^2 + 4x + 2x^2 + 6x + 8$$

$$x^3 + 5x^2 + 10x + 8$$

$$20. (x^4 - 3x^3 - 11x^2 + 3x + 10) \div (x - 5)$$

$$\begin{array}{r} 5 \overline{) 1 \quad -3 \quad -11 \quad 3 \quad 10} \\ \underline{5 \quad 10 \quad -5 \quad -10} \\ 1 \quad 2 \quad -1 \quad -2 \quad \underline{0} \end{array}$$

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

$$22. \frac{2x^3 + 5x^2 - 2x - 15}{2x - 3}$$

$$\begin{array}{r} \frac{2x^3}{2} + \frac{5x^2}{2} - \frac{2x}{2} - \frac{15}{2} \\ x^3 + \frac{5}{2}x^2 - x - \frac{15}{2} \\ \frac{3}{2} \overline{) 1 \quad \frac{5}{2} \quad -1 \quad -\frac{15}{2}} \\ \underline{\frac{3}{2} \quad \frac{15}{2} \quad -\frac{3}{2} \quad -\frac{15}{2}} \\ 1 \quad \frac{8}{2} = 4 \quad 5 \quad \underline{0} \end{array}$$

$$x^2 + 4x + 5$$

Express the following in scientific notation in simplest form.

$$23. 94,700,000 \quad 9.47 \times 10^7$$

$$24. 0.000000032 \quad 3.2 \times 10^{-8}$$

$$25. (2.4 \times 10^3)(1.2 \times 10^4) \quad 2.88 \times 10^7$$

$$26. \frac{13.44 \times 10^4}{3.2 \times 10^7} \quad 4.2 \times 10^{-3}$$