

Simplify:

$$1. 4x^2 - 3x - 2x^2 - 7x + 1 \quad 2. (2x^3 + 4x^2 - 6) - (5x^3 + 2x^2 - 2) \quad 3. 8(x+1) - 3(x-6)$$

$$2x^2 - 10x + 1 \quad -2x^3 + 2x^2 - 4 \quad 8x + 8 - 3x + 18$$

$$5x + 26$$

$$4. (6s^2 + 3s + 7) + (2s^3 - 6s - 4) \quad 5. (8c^4 + 2c + 3) - (3c^2 - c + 1)$$

$$2s^3 + 6s^2 - 3s + 3 \quad 8c^4 - 3c^2 + 3c + 2$$

$$6. 5x - 3 - (x + 1) \quad 7. 7x^2 - 5x - 3(x + 4) \quad 8. 2(x - 3) - 5(x + 2)$$

$$5x - 3 - x - 1 \quad 7x^2 - 5x - 3x - 12 \quad 2x - 6 - 5x - 10$$

$$4x - 4 \quad 7x^2 - 8x - 12 \quad -3x - 16$$

$$9. (7n + 8)(8n - 3) \quad 10. 3n^2(8n^2 + 5n - 8) \quad 11. (x + 6y)(5x + 7y)$$

$$56n^2 - 21n + 64n - 24 \quad 24n^4 + 15n^3 - 24n^2 \quad 5x^2 + 7xy + 30xy + 42y^2$$

$$56n^2 + 43n - 24 \quad 5x^2 + 37xy + 42y^2$$

$$12. (6x - 7)^2 \quad 13. (6a - 6)(-2a^2 - 4a - 8) \quad 14. (2a + 5)(3a - 4)(a - 8)$$

$$36x^2 - 84x + 49 \quad -12a^3 - 24a^2 - 48a \quad (2a+5)(3a^2-28a+32)$$

$$12a^2 + 24a + 48 \quad -12a^3 - 24a^2 - 48a + 48 \quad 6a^3 - 56a^2 + 64a$$

$$6a^3 - 41a^2 - 76a + 160$$

$$15. (n^3 + 7n^2 + 14n + 3) \div (n + 2)$$

$$\begin{array}{r} -2 \overline{) 1 \ 7 \ 14 \ 3} \\ \underline{-2 \ -10 \ -8} \\ 1 \ 5 \ 4 \ \underline{5} \\ n^2 + 5n + 4 - \frac{5}{n+2} \end{array}$$

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

$$\begin{array}{r} x^2 - 3x + 2 \overline{) x^4 - 3x^3 + x^2 + 4x - 4} \\ \underline{-x^4 - 3x^3 + 2x} \\ -x^2 + 4x - 4 \\ \underline{-x^2 + 3x - 2} \\ x - 2 \end{array}$$

$$x^2 - 1 + \frac{x-2}{x^2 - 3x + 2}$$

$$16. (p^3 - 10p^2 + 20p + 26) \div (p - 5)$$

$$\begin{array}{r} 5 \overline{) 1 \ -10 \ 20 \ 26} \\ \underline{5 \ -25 \ -25} \\ 1 \ -5 \ -5 \ \underline{1} \\ p^2 - 5p - 5 + \frac{1}{p-5} \end{array}$$

Express in simplest form without negative or zero exponents

$$17. x^8 \cdot \frac{1}{x^3}$$

$$\frac{x^8}{x^3} = x^5$$

$$18. \frac{2x^{-1}}{y^{-2}}$$

$$\frac{2y^2}{x}$$

$$19. \frac{3a^2x^{-2}}{axy^{-1}}$$

$$\frac{3ay}{x^3}$$

$$20. \frac{p^2q^{-3}}{q^{-4}r^5}$$

$$\frac{p^2q}{r^5}$$

$$21. \frac{(2u^2)^{-2}}{u^{-2}v^{-2}}$$

$$\frac{2^{-2}u^{-2}}{u^{-2}v^{-2}} = \frac{v^2}{4}$$

$$22. \left(\frac{a}{b^{-1}}\right)^{-1}$$

$$\frac{b^{-1}}{a} = \frac{1}{ab}$$

$$23. (a^{-1}z^2)^{-3}$$

$$a^3z^{-6} = \frac{a^3}{z^6}$$

$$24. \left(\frac{3p^{-1}}{2q^2}\right)^{-3}$$

$$\left(\frac{2q}{3p^{-1}}\right)^3 = \frac{8q^3}{27p^{-3}} = \frac{8p^3q^3}{27}$$

$$25. 4p^2(2p^2q)^{-1}$$

$$\frac{4p^2}{2p^2q} = \frac{2}{q}$$

$$26. \left(\frac{a}{b^2}\right)^{-1} \left(\frac{a^2}{b}\right)^{-2}$$

$$\frac{b^2}{a} \cdot \left(\frac{b}{a^2}\right)^2 = \frac{b^2}{a} \cdot \frac{b^2}{a^4} = \frac{b^4}{a^5}$$

$$27. \frac{x^2}{y} \left(\frac{2x}{y^2}\right)^{-2}$$

$$\frac{x^2}{y} \cdot \left(\frac{y^2}{2x}\right)^2 = \frac{x^2}{y} \cdot \frac{y^4}{4x^2} = \frac{y^3}{4}$$

$$28. \frac{xy^9}{3y^{-2}} \cdot \frac{-7y}{21x^5}$$

$$\frac{-7xy^{10}}{63x^5y^{-2}}$$

$$-\frac{y^{12}}{9x^4}$$

$$29. \frac{y^{10}}{2x^3} \cdot \frac{20x^{14}}{xy^6}$$

$$\frac{20x^{14}y^{10}}{2x^4y^6}$$

$$10x^{10}y^4$$

$$30. \frac{12xy}{7x^4} \cdot \frac{7x^5y^2}{4y}$$

$$\frac{12x^6y^3}{4x^4y}$$

$$3x^2y^2$$

Write each number in scientific notation.

31. Nine billion, two hundred forty-six million.

9,246,000,000

$$9.246 \times 10^9$$

32. Two hundred twelve thousand

212,000

$$2.12 \times 10^5$$

33. sixty-eight thousandths

.068

$$6.8 \times 10^{-2}$$

34. Thirty-five hundredths

.35

$$3.5 \times 10^{-1}$$

Perform the indicated operation. Write your answer in scientific notation and decimal form.

35. $(2 \times 10^5)(3 \times 10^{-7})$

$$6 \times 10^{-2}$$

$$.06$$

36. $(1.5 \times 10^5)(2 \times 10^2)$

$$3 \times 10^7$$

$$39000000$$

37. $(7.1 \times 10^{-2})(2.4 \times 10^{-4})$

$$17.04 \times 10^{-6}$$

$$1.704 \times 10^{-5}$$

$$.00001704$$

38. $(3.5 \times 10^{-4})(1.6 \times 10^{-2})$

$$5.6 \times 10^{-6}$$

$$.0000056$$

39. $\frac{8.4 \times 10^{-4}}{1.2 \times 10^{-7}}$

$$7 \times 10^3$$

$$7,000$$

40. $\frac{2.4 \times 10^5}{4.8 \times 10^3}$

$$.5 \times 10^2$$

$$5 \times 10^1$$

$$50$$