

Do the following problems as indicated.

Evaluate.

1)  $-3^0$

2)  $(-15)^0$

Express using positive exponents. Then simplify.

3)  $5^{-3}$

4)  $(-4)^{-2}$

5)  $-3^{-4}$

6)  $\frac{1}{x^{-3}}$

7)  $\left(\frac{2}{5}\right)^{-4}$

Multiply and simplify.

8)  $5^{10} \cdot 5^{-4}$

9)  $x \cdot x^{-6}$

10)  $y^{-6} \cdot y^{-2}$

Divide and simplify.

11)  $\frac{t^4}{t^7}$

12)  $\frac{p^2}{p^{-4}}$

13)  $\frac{t^{-4}}{t^{-7}}$

14)  $\frac{x}{x^{15}}$

15)  $\frac{y^{-15}}{y^3}$

Simplify.

16)  $(3^4a)^2$

17)  $(-4x^6y)^5$

18)  $\left(\frac{x^4y}{z^3}\right)^4$

19)  $\left(\frac{x^5}{y^5z^4}\right)^3$

20)  $\left(\frac{xy^5}{w^2z}\right)^{-3}$

Write the number in scientific notation.

21) 6,300,000

22) 0.000608

Convert to decimal notation.

23)  $3.5682 \times 10^4$

24)  $8.0576 \times 10^{-7}$

If the number in the statement is written in scientific notation, write it without exponents. If it is written without exponents, write it in scientific notation.

25) The speed of light is  $1.86 \times 10^5$  miles per hour.

26) A computer can do one calculation in  $1.4 \times 10^{-7}$  seconds.

27) It has been estimated that the average American watches 58,240 hours of television in a lifetime.

28) The life span of the average male human being is approximately 37,843,200 minutes.

Perform the indicated operation. Write the answer in scientific notation.

$$29) \frac{6 \times 10^{-4}}{2 \times 10^2}$$

$$30) (5 \times 10^6)(8 \times 10^7)$$

Evaluate the polynomial.

$$31) 5x^3 - 3x^2 - 36 \text{ for } x = 2$$

$$32) -2x^3 + 3x^2 - x - 36 \text{ for } x = -3$$

$$33) -2x^2 - y^2 + xy \text{ for } x = -3 \text{ and } y = 2$$

$$34) x^2yz + x + y \text{ for } x = 2, y = -3, \text{ and } z = 4$$

$$35) x^2 + y^2 - z^2 \text{ for } x = 1, y = 4, \text{ and } z = 3$$

Collect like terms.

$$36) -2m^9 + 14m^3 - 2m^2 + 11m^9 - 4m^3$$

$$37) 14a^9 - 4a^9 + 7a^3 + 9a^9 - 10a^3$$

$$38) 8x^2y + 5z^2y + 5x^2y + 4z^2y$$

Identify the degree of each term and the degree of the polynomial.

$$39) 8x - 9x^2 + 5 - 3x^3$$

$$40) 8x^5 - 8x^2 + 2 - 3x^3$$

$$41) 12x^6yz - 4x^4y^2 + x^3yz^3$$

$$42) xyz^3 + x^3y^4 + xz^2$$

Identify the polynomial as a monomial, binomial, trinomial, or none of these. Give its degree.

$$43) -19c^5 - 2c^4 + 8c^3$$

$$44) -11z + 8$$

$$45) 5a^3$$

Add.

$$46) (2 - 9x^3 + 5x^5 + 6x^4) + (6x^4 - 7x^3 - 8 + 9x^5)$$

$$47) (3x^2 - 3xy + y^2) + (3x^2 - 6xy - y^2) + (x^2 + xy - y^2)$$

$$48) \frac{1}{3}x^2 - \frac{3}{8}x + \frac{3}{5}$$

$$\frac{\frac{1}{6}x^2 - \frac{3}{4}x + \frac{3}{10}}{\quad}$$

Simplify.

$$49) -(-8x^4 - 9x^3 - x^2 + 8)$$

Subtract.

$$50) (16x + 9x^7 - 16x^4) - (-2x^4 + 4x^7 - 17x)$$

$$51) (4x^2y + 3xy) - (2x^2y - 10xy^2 + 5xy)$$

$$52) \begin{array}{r} 3x^4 + 8x^3 + 4 \\ - (x^4 - 5x^3 + x^2 - 7x) \\ \hline \end{array}$$

Multiply.

$$53) \left( \frac{1}{8}x^3 \right) \left( -\frac{1}{5}x^7 \right)$$

$$54) (-8x^4)(4x^3)$$

$$55) (-5x^2)(7x^4)(4x^5)$$

$$56) -10x^3(-4x^4 + 6x^2 + 12)$$

$$57) (4x - 1)(x + 6)$$

$$58) (5x + 3)(x + 8)$$

$$59) (12y + x)(12y - x)$$

$$60) (-5x - 11)(3x + 3)$$

$$61) (3x - 11)(3x + 11)$$

$$62) \left( t + \frac{2}{9} \right) \left( t + \frac{2}{9} \right)$$

$$63) (6p - 1)(36p^2 + 6p + 1)$$

$$64) (8y - 5)(64y^2 + 40y + 25)$$

$$65) (3x^2 - 2x - 2)(x^2 + 4x - 2)$$

$$66) (4x + 3y)^2$$

$$67) (4x + 7)(x - 11)$$

$$68) (4x - 12)(4x + 12)$$

$$69) (x + 1)(4x - 7)$$

$$70) (7p + 2)(7p - 2)$$

$$71) \left( x + \frac{5}{8} \right) \left( x - \frac{5}{8} \right)$$

$$72) (7y^2 - 9)(7y^2 + 9)$$

$$73) (p + 5q)(p - 5q)$$

$$74) (8y + x)(8y - x)$$

$$75) (10m + 7)^2$$

$$76) (5a - 2)^2$$

$$77) (x^2 - 2)^2$$

Perform the division.

$$80) \frac{20x^3 - 41x^2 + 40x - 25}{4x - 5}$$

$$81) \frac{-6x^3 + 7x^2 + 15x + 8}{3x + 1}$$

$$82) \frac{x^3 + 27}{x + 3}$$

$$83) \frac{x^4 + 3x^2 + 10}{x^2 + 1}$$

Divide.

$$78) \frac{20x^{10} + 30x^7}{5x^4}$$

$$79) \frac{4x^2y^3 + 6x^4y^7 - 4x^5y^4}{2x^2y^3}$$