

$$x^2 y^7 z^5 \quad 14$$

$$8x^2 \quad 2$$

$$2^3 x^2 \quad 2$$

$$2^3 x x \quad 2$$

$$12x^0 \quad 0$$

$$0 \quad \text{none}$$

Ex: (p 320)

Find the degree of a polynomial

EX: $2x^3 - 4x^2 + 5x + 4$
3 2 1 0

$4x^2 - 6x^3 + 12x - 4$
2 3 1 0

Find the value of each polynomial when (a) $x = 0$ and (b) $x = -1$. See Examples 4 and 5.

$$16. x^2 - 4$$

$$x=0 \quad (0)^2 - 4 = 0 - 4 = -4$$

$$x=-1 \quad (-1)^2 - 4 = 1 - 4 = -3$$

$$18. -2x^3 + 3x^2 - 6$$

$$x=0$$

$$-2(0)^3 + 3(0)^2 - 6 = -6$$

$$x=-1$$

$$-2(-1)^3 + 3(-1)^2 - 6$$

$$-2(-1) + 3 - 6$$

$$2 + 3 - 6 = -1$$

Simplify

$$24. 18x^3 - 4x^3 = 14x^3$$

$$32. \frac{1}{6}x^4 - \frac{1}{7}x^2 + 5 \frac{3 \cdot 1}{3 \cdot 2}x^4 - \frac{3}{7}x^2 + \frac{1}{3}$$

$$\frac{1}{6}x^4 - \frac{3}{6}x^4 - \frac{1}{7}x^2 - \frac{3}{7}x^2 + \frac{1}{3}$$

$$-\frac{2}{6}x^4 - \frac{4}{7}x^2 + \frac{1}{3}$$

$$-\frac{1}{3}x^4 - \frac{4}{7}x^2 + \frac{1}{3}$$

Perform the Following:

$$36. \quad \underline{(3x^2 + 7)} + \underline{(3x^2 + 9)}$$

$$6x^2 + 16$$

$$40. \quad (5x^2 + 4) - (-2y^2 + 4)$$

$$\underline{5x^2 + 4} \quad \underline{+ 2y^2 - 4}$$

$$5x^2 + 2y^2$$

$$44. \quad (-7x^2 + 4x + 7) - (-8x + 2)$$

$$\underline{-7x^2 + 4x + 7} \quad \underline{+ 8x - 2}$$

$$-7x^2 + 12x + 5$$

$$46. \quad \frac{7x^3 + 3}{+2x^3 + 1} = 2x^3 + 4$$

$$48. \quad \frac{5u^5 - 4u^2 + 3u - 7}{-(3u^5 + 6u^2 - 8u + 2)}$$

$$\begin{array}{r} 5u^5 - 4u^2 + 3u - 7 \\ -3u^5 - 6u^2 + 8u - 2 \\ \hline \end{array}$$

$$2u^5 - 10u^2 + 11u - 9$$

$$60. \quad \underline{(6y^5 - 6y^3 + 4)} + \underline{(-2y^5 - 8y^3 - 7)}$$

$$4y^5 - 14y^3 - 3$$

$$62. (-a^2 + 1) - (a^2 - 3) + (5a^2 - 6a + 7)$$

$$\begin{array}{r} \underline{-a^2+1} \quad \underline{-a^2+3} \quad \underline{+5a^2-6a+7} \\ \quad \quad \end{array}$$

$$3a^2 - 6a + 11$$

68. Subtract $(5y + 7x^2)$ from the sum of $(8y - x)$ and $(3 + 8x^2)$.

70. Subtract $(4x^2 - 2x + 2)$ from the sum of $(x^2 + 7x + 1)$ and $(7x + 5)$.

80. $(3x - 2 + 6y) + (7x - 2 - y)$

86. $(3x^2y - 6xy + x^2y^2 - 5) - (11x^2y^2 - 1 + 5yx^2)$

92. $-7x(x)$

94. $6r^3(7r^{10})$

96. $-z^2y(11zy)$

5.3: Multiplying Polynomials

Ex: (p 327)

2. $9t^6(-3t^5)$

4. $(-5.2x^4)(3x^4)$

6. $\left(-\frac{3}{4}y^7\right)\left(\frac{1}{7}y^4\right)$

8. $(x)(5x^4)(-6x^7)$

18. $-x(6y^3 - 5xy^2 + x^2y - 5x^3)$

22. $(x + 2)(x + 9)$

24. $(y - 10)(y + 11)$

26. $\left(x + \frac{3}{5}\right)\left(x - \frac{2}{5}\right)$

28. $(5x^2 + 2)(6x^2 + 2)$

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

38. $(x + 3)(x^2 + 5x - 8)$

42. $(3 + b)(2 - 5b - 3b^2)$

44. $(y - 1)^3$

46. $(3x + 4)^3$

50. $(4x - 5)(8x^2 + 2x - 4)$

52. $(3x^2 - x + 2)(x^2 + 2x + 1)$

56. $-5x(x^2 - 3x + 10)$

60. $\left(m + \frac{2}{9}\right)\left(m - \frac{1}{9}\right)$

68. $(5x + 4)(x^2 - x + 4)$

70. $(a^2 + 3a - 2)(2a^2 - 5a - 1)$

5.4: Special Products

Ex: (p 334)

4. $(y - 12)(y + 4)$

6. $(3y - 5)(2y - 7)$

12. $(x + 7)^2$

24. $(4x - 5)(4x + 5)$

26. $\left(10x + \frac{2}{7}\right)\left(10x - \frac{2}{7}\right)$

28. $(2x - y)(2x + y)$

36. $(6a + 7)(6a + 5)$

38. $(x - 10)(x + 10)$

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

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

48. $(11x - 7y)(11x + 7y)$

54. $(x^5 + 5)(x^2 - 8)$

62. $\left(\frac{2}{3}a - b^2\right)\left(\frac{2}{3}a - b^2\right)$

70. $(3x + 5)(3x - 5)$

74. $\left(\frac{a}{2} + 4y\right)\left(\frac{a}{2} - 4y\right)$

78. $(b + 3)(2b^2 + b - 3)$

82. $\frac{x^3y^6}{xy^2}$

84. $\frac{-6a^8y}{3a^4y}$

86. $\frac{-48ab^6}{32ab^3}$

5.5: Negative Exponents & Scientific Notation

Look at division

Negative Exponents

If a is a real number other than 0 and n is an integer, then

$$a^{-n} = \frac{1}{a^n}$$

Negative Exponents

If a is a real number other than 0 and n is an integer, then

$$a^{-n} = \frac{1}{a^n} \quad \text{and} \quad \frac{1}{a^{-n}} = a^n$$

Ex: (p 343)

2. 6^{-2}

8. $\left(\frac{1}{8}\right)^{-2}$

16. $\frac{r^{-5}}{s^{-2}}$

22. $4^{-2} - 4^{-3}$

24. $\frac{-1}{y^{-6}}$

Summary of Exponent Rules

If m and n are integers and a , b , and c are real numbers, then:

Product rule for exponents: $a^m \cdot a^n = a^{m+n}$

Power rule for exponents: $(a^m)^n = a^{m \cdot n}$

Power of a product: $(ab)^n = a^n b^n$

Power of a quotient: $\left(\frac{a}{c}\right)^n = \frac{a^n}{c^n}$, $c \neq 0$

Quotient rule for exponents: $\frac{a^m}{a^n} = a^{m-n}$, $a \neq 0$

Zero exponent: $a^0 = 1$, $a \neq 0$

Negative exponent: $a^{-n} = \frac{1}{a^n}$, $a \neq 0$

Ex: (p 343)

$$46. \frac{-5x^4y^5}{15x^4y^2}$$

$$48. (-5a^4b^{-7})(-a^{-4}b^3)$$

$$52. \left(\frac{a^5b}{a^7b^{-2}}\right)^{-3}$$

$$56. \frac{5^{-1}z^7}{5^{-2}z^9}$$

$$58. \frac{6^{-5}x^{-1}y^2}{6^{-2}x^{-4}y^4}$$

$$60. \left(\frac{r^{-2}s^{-3}}{r^{-4}s^{-3}}\right)^{-3}$$

$$68. \frac{(a^6b^{-2})^4}{(4a^{-3}b^{-3})^3}$$

5.6: Dividing Polynomials

Dividing a Polynomial By a Monomial

Divide each term of the polynomial by the monomial.

$$\frac{a + b}{c} = \frac{a}{c} + \frac{b}{c}, \quad c \neq 0$$

Ex: (p 350)

2. $\frac{15x^2 - 9x^5}{x}$

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

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

34. $\frac{m^3n^2 - mn^4}{mn}$