

Quiz

Evaluate

$$1. -4^2 = -16$$

$$2. (-4)^2 = 16$$

$$3. (2x^3)^4 = x^{12} \mid 16x^{12}$$

$$4. 2^4 \cdot 2^{13} \quad (\text{Simplify}) = 2^{17}$$

$$5. -3x^0 = -3$$

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

$$(8y - x) + (3 + 8x^2) - (5y + 7x^2)$$

$$\underline{8x^2} - x + \underline{8y} + 3 \quad - \underline{5y} - \underline{7x^2}$$

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

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

$$(x^2 + 7x + 1) + (7x + 5) - (4x^2 - 2x + 2)$$

$$\underline{x^2} + \underline{14x} + \underline{6} \quad - \underline{4x^2} + \underline{2x} - \underline{2}$$

$$-3x^2 + 16x + 4$$

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

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

$$\underline{3x^2y} - \underline{6xy} + \underline{x^2y^2} - \underline{5} - \underline{11x^2y^2} + \underline{1} - \underline{5x^2y}$$

$$-2x^2y - 6xy - 10x^2y^2 - 4$$

$$92. -7x(x) = -7x^2$$

$$94. 6r^3(7r^{10}) = 42r^{13}$$

$$96. -z^2y(11zy) = -11z^3y^2$$

5.3: Multiplying Polynomials

Ex: (p 327)

$$2. 9t^6(-3t^5) = -27t^{11}$$

$$4. (-5.2x^4)(3x^4) = -15.6x^8$$

$$6. \left(-\frac{3}{4}y^7\right)\left(\frac{1}{7}y^4\right) = -\frac{3}{28}y^{11}$$

$$8. (x)(5x^4)(-6x^7) = -30x^{12}$$

$$2(3x + 4) = 6x + 8$$

$$18. -x(6y^3 - 5xy^2 + x^2y - 5x^3)$$
$$-6xy^3 + 5x^2y^2 - x^3y + 5x^4$$

$$\underline{(x+2)}(x+4)$$

$$(x+2)x + (x+2)4$$

$$x(x+2) + 4(x+2)$$

$$\underline{x^2 + 2x + 4x + 8}$$

$$x^2 + 6x + 8$$

$$\begin{array}{c} \text{---} \\ \text{---} \\ (x+2)(x+4) \\ \text{---} \end{array}$$

$$\underline{x^2 + 4x + 2x + 8}$$

$$x^2 + 6x + 8$$

$$y(x+4)$$

$$yx + y4$$

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

$$x^2 + 9x + 2x + 18$$

$$x^2 + 11x + 18$$

$$(x + y)(2z + 3w)$$

$$2xz + 3wx + 2yz + 3wy$$

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

$$y^2 + 11y - 10y - 110$$

$$y^2 + y - 110$$

FOIL

First
Outer
Inner
Last

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

$$3x^3 - 5x^2 + 4x$$

$$+ 9x^2 - 15x + 12$$

$$3x^3 + 4x^2 - 11x + 12$$

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

$$x^2 - \frac{2}{5}x + \frac{3}{5}x - \frac{6}{25}$$

$$x^2 + \frac{1}{5}x - \frac{6}{25}$$

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

$$30x^4 + 10x^2 + 12x^2 + 4$$

$$30x^4 + 22x^2 + 4$$

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

$$x^4 + 4x^2 + 4x^2 + 16$$

$$x^4 + 8x^2 + 16$$

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