7-4 Division Properties of Exponents *(pp. 481–487)*

EXAMPLES

■ **Simplify $\frac{x^9}{x^2}$.**

$\frac{x^9}{x^2} = x^{9-2} = x^7$ *Subtract the exponents.*

EXERCISES

Simplify.

53. $\frac{2^8}{2^2}$ **54.** $\frac{m^6}{m}$ **55.** $\frac{2^6 \cdot 4 \cdot 7^3}{2^5 \cdot 4^4 \cdot 7^2}$

56. $\frac{24b^6}{4b^5}$ **57.** $\frac{t^4v^5}{tv}$ **58.** $\left(\frac{1}{2}\right)^{-4}$

Simplify each quotient and write the answer in scientific notation.

59. $(2.5 \times 10^8) \div (0.5 \times 10^7)$

60. $(2 \times 10^{10}) \div (8 \times 10^2)$

7-5 Rational Exponents *(pp. 488–493)*

EXAMPLES

■ **Simplify $\sqrt[3]{r^6s^{12}}$.**

$\sqrt[3]{r^6s^{12}} = (r^6s^{12})^{\frac{1}{3}}$ *Definition of $b^{\frac{1}{n}}$*

$= (r^6)^{\frac{1}{3}} \cdot (s^{12})^{\frac{1}{3}}$ *Power of a Product Property*

$= \left(r^{6 \cdot \frac{1}{3}}\right) \cdot \left(s^{12 \cdot \frac{1}{3}}\right)$ *Power of a Power Property*

$= (r^2) \cdot (s^4)$ *Simplify exponents.*

$= r^2s^4$

EXERCISES

Simplify each expression.

61. $81^{\frac{1}{2}}$ **62.** $343^{\frac{1}{3}}$

63. $64^{\frac{2}{3}}$ **64.** $(2^6)^{\frac{1}{2}}$

Simplify each expression. All variables represent nonnegative numbers.

65. $\sqrt[5]{z^{10}}$ **66.** $\sqrt[3]{125x^6}$

67. $\sqrt{x^8y^6}$ **68.** $\sqrt[3]{m^6n^{12}}$

7-6 Polynomials *(pp. 496–501)*

EXAMPLES

■ **Find the degree of the polynomial $3x^2 + 8x^5$.**

$3x^2 + 8x^5$ *$8x^5$ has the highest degree.*

The degree is 5.

■ **Classify the polynomial $y^3 - 2y$ according to its degree and number of terms.**

Degree: 3
Terms: 2

The polynomial $y^3 - 2y$ is a **cubic binomial**.

EXERCISES

Find the degree of each polynomial.

69. 5 **70.** $8st^3$

71. $3z^6$ **72.** $6h$

Write each polynomial in standard form. Then give the leading coefficient.

73. $2n - 4 + 3n^2$ **74.** $2a - a^4 - a^6 + 3a^3$

Classify each polynomial according to its degree and number of terms.

75. $2s - 6$ **76.** $-8p^5$

77. $-m^4 - m^2 - 1$ **78.** 2