

65. Kathy and Allen drive through the sunny Southwest on their summer vacation. Kathy drives for 3 hours, and after lunch Allen drives for 3 hours at a speed 15 miles per hour slower than Kathy drove. Write an expression for their average speed in terms of Kathy's speed.
66. It takes the main inlet pipe 30 hours to fill the dolphin tank at the zoo, and the auxiliary pipe takes 45 hours. How long will it take both pipes running together to fill the tank?
67. The land area of the earth is 57,267,400 square miles. In the year 2000 the population of the earth will be 6,100,000,000.
- Express both of these numbers in scientific notation.
  - In the year 2000, how many people will there be for each square mile of the earth's surface?
68. The average distance from the sun to the earth is 92,956,000 miles. Sunlight travels at 186,000 miles per second.
- Express each of these numbers in scientific notation.
  - How long does it take sunlight to reach the earth?

**B**

■ *Divide.*

69. 
$$\frac{x^3 - 2x^2 + x + 1}{x^2 - x + 2}$$

70. 
$$\frac{x^4 - x^2 - 2}{x^2 + 4}$$

■ *Simplify.*

71. 
$$1 + \frac{1 - \frac{1}{2}}{1 + \frac{1}{1 + \frac{1}{2}}}$$

72. 
$$\frac{3 - \frac{1}{\frac{x}{y} - 2}}{2 + \frac{3}{\frac{x}{2y} - 1}}$$

73. 
$$\frac{\frac{1}{a - b}}{\frac{a}{a^2 - b^2}} + \frac{ab - b^2}{ab}$$

74. 
$$\frac{a^2 - b^2}{a - b} - \frac{a - b}{\frac{1}{b}}$$

■ *Simplify. Write your answer using positive exponents only.*

75. 
$$\frac{(xy^{-1})^{-1}(x^2y^2)^{-2}(x^{-1}y)^0}{(x^{-3}y^2)^{-1}(x^{-1}y^{-3})^{-1}}$$

76. 
$$\frac{(x^2y^3)^{-2}(xy^{-3})^0(x^3y^2)^{-1}}{(x^5y^{-2})^{-2}(x^4y)^2}$$

■ *Factor. Write your answer using positive exponents only.*

77. 
$$x^2(x + 1)^{-3} - 4(x + 1)^{-1}$$

78. 
$$4(x + 2)^{-2}(x - 3) + 6(x + 2)^{-1}(x - 3)^{-1}$$