Name: _____

Concept and Vocabulary:

Fill in each of the following blanks with "positive," "negative," "0," or "undefined."

1. The product of two negative numbers is a/an _____ number.

2. The product of a negative number and a positive number is a/an _____ number.

3. The product of three negative numbers is a/an _____ number.

4. The product of an even number of negative numbers is a/an _____ number.

5. The product of two negative numbers and 0 is _____.

6. The multiplicative inverse, or reciprocal, of a negative number is a/an _____ number.

7. The quotient of a positive number and a negative number is a/an _____ number.

8. The quotient of two negative numbers is a/an _____ number.

9. The quotient of 0 and a negative number is _____.

10. The quotient of a negative number and 0 is _____.

11. The opposite of a negative number is a/an _____ number.

Practice Exercises:

In exercises 1 - 33, perform the indicated multiplication.

1. $5(-9)$

3. $(-8)(-3)$

5. $(-3)(7)$

7. $(-19)(-1)$

9. $0(-19)$

11. $\frac{1}{2}(-24)$

13. $\left(-\frac{3}{4}\right)(-12)$

15. $-\frac{3}{5} \cdot \left(-\frac{4}{7}\right)$

17. $-\frac{7}{9} \cdot \frac{2}{3}$

19. $3(-1.2)$

21. $-0.2(-0.6)$

23. $(-5)(-2)(3)$

25. $(-4)(-3)(-1)(6)$

27. $-2(-3)(-4)(-1)$

29. $(-3)(-3)(-3)$

31. $5(-3)(-1)(2)(3)$

33. $(-8)(-4)(0)(-17)(-6)$

In exercises 35 - 41 odd, find the multiplicative inverse of each number.

35. 4

37. $\frac{1}{5}$

39. -10

41. $-\frac{2}{5}$

2

In exercises 47 - 75 odd, perform the indicated division or state that the expression is undefined.

47. $\frac{12}{-4}$

49. $\frac{-21}{3}$

51. $\frac{-90}{-3}$

53. $\frac{0}{-7}$

55. $\frac{7}{0}$

57. $-15 \div 3$

59. $120 \div (-10)$

61. $(-180) \div (-30)$

63. $0 \div (-4)$

65. $-4 \div 0$

67. $\frac{-12.9}{3}$

69. $-\frac{1}{2} \div \left(-\frac{3}{5}\right)$

71. $-\frac{14}{9} \div \frac{7}{8}$

73. $\frac{1}{3} \div \left(-\frac{1}{3}\right)$

75. $6 \div \left(-\frac{2}{5}\right)$

In exercise 77 - 95 odd, simplify each algebraic expression.

77. $-5(2x)$

79. $-4\left(-\frac{3}{4}y\right)$

81. $8x + x$

83. $-5x + x$

3

85. $6b - 7b$

93. $-(2y - 5)$

89. $-4(2x - 3)$

95. $4(2y - 3) - (7y + 2)$

91. $-3(-2x + 4)$

In exercises 97 - 107 odd, determine whether the given number is a solution of the equation.

97. $4x = 2x - 10; -5$

103. $4(6 - z) + 7z = 0; -8$

99. $-7y + 18 = -10y + 6; -4$

105. $14 - 2x = -4x + 7; -2\frac{1}{2}$

101. $5(w + 3) = 2w - 21; -10$

107. $\frac{5m-1}{6} = \frac{3m-2}{4}; -4$

4

Applications:

In the years after warning labels were put on cigarettes packs, the number of smokers dropped from approximately two in five adults to one in five. The bar graph on page 85 shows the percentage of American adults who smoked cigarettes for selected years from 1965 through 2009.

The percentage of Americans who smoked cigarettes, C, may be approximated by the following mathematical model, where x is the number of years after 1965.

$$C = -0.5x + 41$$

Use this information to work out exercise 119.

119. a. Does the mathematical model underestimate or overestimate the percentage of American adults who smoked cigarettes in 2009? By how much?

b. Use the mathematical model to project the percentage of American adults who will smoke cigarettes in 2015.

The graph on page 85 shows the average number of hours per week women and men in the United States devoted to household chores and child care for five selected years from 1965 through 2005.

The Average number of hours per week devoted to household chores and child care by wives, W, and husbands, H, may be approximated by the following mathematical models where n is the number of years after 1965.

$$W = -0.4n + 39$$

$$H = 0.2n + 12$$

Use this information to work out exercise 121.

121.   a. Use the appropriate graph to estimate the average number of hours per week devoted to household chores and child care by wives in 2005.

   b. Use the appropriate formula to determine the average number of hours per week devoted to household chores and child care by wives in 2005. How does this compare with your estimate in part (a)?

   c. Write a formula that describes the difference between the average number of hours per week devoted to household chores and child care between wives and husbands n years after 1965. Name this new mathematical model D, for difference. Then simplify the algebraic expression in the model.

   d. Use the simplified form of the mathematical model from part (c) to determine the difference in the number of hours per week women and men spent on household chores and child care in 2005. Does this overestimate or underestimate the difference displayed in the graphs?