To Change a Percent to a Decimal Number

1. Move the decimal point two places to the left.
2. Delete the % sign.

PROCEDURE

13. Change each percent to an equivalent decimal number.

a. 40%

b. 29.37%

c. 102%

d. 0.6%

Example 13 Changing Percents to Decimal Numbers

Change each percent to an equivalent decimal number.

a. 72% **b.** 16.2% **c.** 100% **d.** 0.25%

Solution

a. 72% = 0.72 ← % symbol deleted

Understood decimal point

Decimal point moved two places to the left

b. 16.2% = 0.162

c. 100% = 1.00 = 1

d. 0.25% = 0.0025 Note that when moving the decimal point two places to the left, two zeros were added as placeholders.

Now work margin exercise 13.

Margin Exercise Answers

1. 39.0184; thirty-nine and one hundred eighty-four ten-thousandths **2.** 1200.0005 **3.** 0.1205 **4.** 6.44 **5.** 9.251 **6.** 42.077 **7.** 5.962 **8.** $8.68 **9.** 16.0146 **10.** 13.2 **11.** 14.9 **12. a.** 87.1% **b.** 0.35% **c.** 217% **d.** 10% **13. a.** 0.4 **b.** 0.293 **c.** 1.02 **d.** 0.006

R.4 Exercises

Concept Check

Fill-in-the-Blank. Complete each sentence using information found in this section.

1. Decimal notation uses the _____ _____ system.
2. A _____ _____ consists of a whole number and a fraction written next to each other.
3. When reading decimal numbers, the word "_____" is used in place of the decimal point.
4. When comparing decimal numbers, you should compare each digit moving _____ to _____.

5. To keep digits vertically aligned when adding decimal numbers, _____ may be used.

6. The word _____ comes from the Latin per centum, meaning "per hundred."

True/False. Determine whether each statement is true or false. If a statement is false, explain how it can be changed so the statement will be true. (**Note:** There may be more than one acceptable change.)

7. On a number line, any number to the left of another number is larger than that other number.

8. It is important to align the decimal points vertically when adding decimal numbers.

9. The decimal points should be aligned vertically when multiplying decimal numbers.

10. The first step in division with decimal numbers is to move the decimal point in the divisor to the right so that the divisor is a whole number.

Practice

Write each decimal number in words. See Example 1.

1. 0.9

2. 0.5

3. 20.7

4. 96.3

5. 1.53

6. 2.79

7. 19.102

8. 18.051

9. 800.009

10. 500.005

Write each number in decimal notation. See Examples 2 and 3.

11. three tenths

12. seven tenths

13. seventeen and nine tenths

14. eight hundred and three tenths

15. twenty-three hundredths

16. seventy-two hundredths

17. six and twenty-eight thousandths

18. fourteen and ninety-seven thousandths

19. four thousand five hundred two ten-thousandths

20. seven thousand one hundred sixty-five ten-thousandths

For each pair of decimal numbers, determine which number is larger. See Examples 4 and 5.

21. 0.26, 0.27

22. 0.45, 0.48

23. 0.153, 0.163

24. 4.537, 4.527

25. 23.521, 24.295

26. 110.241, 101.862

27. 0.01, 0.009

28. 4.002, 4.0008

Arrange each set of decimal numbers in order from smallest to largest. Then, graph the numbers on a number line. See Example 6.

29. 0.3, 0.03, 0.33

30. 0.55, 0.05, 0.5

31. 0.2, 0.26, 0.17

32. 1.8, 1.75, 1.86

33. 0.157, 0.2611, 0.192, 0.26

34. 1.432, 1.54, 1.14, 1.5422

Perform the indicated operations. Round any quotient to the nearest hundredth.

35. $0.6+0.4+0.4$

36. $7+5.1+0.8$

37. $0.79+4.92+0.05$

38. $4.005+0.056+0.9$

39. $5.4-3.76$

40. $17.83-9.9$

41. $39.6-13.71$

42. $55.002-53.008$

43.
$$\begin{array}{r} 57.3 \\ 52.08 \\ +38.005 \\ \hline \end{array}$$

44.
$$\begin{array}{r} 1.007 \\ 30.442 \\ +\ 4.992 \\ \hline \end{array}$$

45.
$$\begin{array}{r} 21.007 \\ -\ 1.543 \\ \hline \end{array}$$

46.
$$\begin{array}{r} 30. \\ -\ 6.45 \\ \hline \end{array}$$

47. $(0.2)(0.2)$

48. $8(0.125)$

49.
$$\begin{array}{r} 0.137 \\ \times 0.08 \\ \hline \end{array}$$

50.
$$\begin{array}{r} 6.09 \\ \times 0.11 \\ \hline \end{array}$$

51. $28 \div 5.6$

52. $35 \div 1.64$

53. $2.7\overline{)5.483}$

54. $2.54\overline{)45}$

Change the following decimals to percents. See Example 12.

55. 0.03

56. 0.052

57. 3.0

58. 2.5

59. 1.08

60. 0.5

Change the following percents to decimals. See Example 13.

61. 6%

62. 11%

63. 3.2%

64. 12.5%

65. 120%

66. 80%

Applications

In each exercise, write the decimal numbers that are not whole numbers in words.

67. The tallest unicycle ever ridden was 114.8 feet tall, and was ridden by Sam Abrahams (with a safety wire suspended from an overhead crane) for a distance of 28 feet in Pontiac, Michigan, on January 29, 2004. [1]

68. A penny dated from 1959 through 1982 had an original weight of 3.11 grams. A penny dated 1983 or later had an original weight of 2.5 grams. Write the numbers representing weights in words.

69. One yard is equal to 36 inches. One yard is also approximately equal to 0.914 meter. One meter is approximately equal to 1.09 yards. One meter is also approximately equal to 39.37 inches. (Thus, a meter is longer than a yard by about 3.37 inches.)

70. One foot is equal to 12 inches. One foot is also equal to 30.48 centimeters. One square foot is approximately 0.093 square meters.

71. One quart of water weighs approximately 2.0825 pounds.

72. The number π is approximately equal to 3.14159.

73. The number e is approximately equal to 2.71828.

74. The largest state in the United States is Alaska, which covers approximately 656.4 thousand square miles. The second largest state is Texas, which approximately 268.6 thousand square miles. Alaska is more than 10 times the size of Wisconsin (twenty-third in size), with about 65.5 thousand square miles.

75. World Records: 9.58 seconds for 100 meters (by Usain Bolt, Jamaica, 2009); 19.19 seconds for 200 meters (by Usain Bolt, Jamaica, 2009); 43.18 seconds for 400 meters (by Michael Johnson, USA, 1999). [2]

76. The mean distance from the Sun to Earth is about 92.9 million miles and from the Sun to Venus is 67.24 million miles. One period of revolution of the Earth about the Sun takes 365.2 days, and one period of revolution of Venus about the sun takes 224.7 days.

77. An interesting fact about aging is that the longer you live, the longer you can expect to live. A white male of age 40 can expect to live 35.8 more years; of age 50, can expect to live 26.9 more years; of age 60 can expect to live 18.9 more years; of age 70 can expect to live 12.3 more years; and of age 80 can expect to live 7.2 more years. (This same phenomenon is true of men and women of all races.)

1 Source: http://semcycle.biz/record
2 Source: http://en.wikipedia.org/wiki/List_of_world_records_in_athletics

Writing & Thinking

78. In your own words, state why the word "and" is so commonly misused when numbers are spoken and/or written. Bring an example of this from a newspaper, magazine, or television show to share with the class.

79. Discuss situations where you think it is particularly appropriate (or necessary) to write numbers in English word form.

80. With **a.** and **b.** as examples, explain in your own words how you can tell quickly when one decimal number is larger (or smaller) than another decimal number.

a. The decimal number 2.765274 is larger than the decimal number 2.763895.

b. The decimal number 17.345678 is larger than the decimal number 17.345578.