Solve.

17. Round 8,708,756 to the given number of significant digits.

    a) 1 significant digit   _____

    b) 2 significant digits   _____

    c) 3 significant digits   _____

    d) 4 significant digits   _____

18. Round 46,009.491 to the given number of significant digits.

    a) 4 significant digits   _____

    b) 5 significant digits   _____

    c) 6 significant digits   _____

    d) 7 significant digits   _____

Solve.

19. If a stopwatch is capable of showing a time up to one hundredth of a second, how many significant digits in the reading of 200.0000 seconds are reliable?

20. In Neptune's orbit around the Sun, the farthest point from the Sun is 2,829,691,160 miles. If the distance is rounded to the nearest 100,000, how many of the trailing zeros are significant?

21. A measuring cylinder gives a reading of 3.67 liters. Which significant digit is the least reliable?

22. The current world population is approximately 6,976,950,760. Round this figure to 6 significant digits.

23. The current world record of men's 400-meter dash was completed with a time of 43.18 seconds in 1999. What was the average speed of the runner, in meters per second, correct to 3 significant digits?

24. An engineer wanted to measure the diameter of a metal cylinder. She measured the diameter at different points along the cylinder. Each measurement was rounded to the nearest 0.01 millimeter. She jotted down these measurements: 6, 6.4, 5.75, 5.25, and 5.36.

a) Given that the measurements were rounded to the nearest 0.01 millimeter, how should she have written the measurements of 6 and 6.4?

b) Find the mean of the diameters. Give your answer using the correct number of significant digits.

17. a) 9,000,000   **b)** 8,700,000

     c) 8,710,000   **d)** 8,709,000

18. a) 46,010   **b)** 46,009

     c) 46,009.5   **d)** 46,009.49

19. 5

20. None of the trailing zeros are significant because the distance is a rounded value to the nearest 100,000.

21. The digit 7 is the least reliable.

22. 6,976,950,000

23. Average speed $= 9.2635...$m/s $= \dfrac{400}{43.18}$ m/s

The average speed, correct to 3 significant digits, is 9.26 meters per second.

24. a) 6.00, 6.40

     b) Mean diameter

$$= \frac{6.00 + 6.40 + 5.75 + 5.25 + 5.36}{5}$$

     $= 5.752$ mm

     The mean of the diameters is 5.75 millimeters.