Looking Ahead

To calculate even the simplest of statistics, it is necessary to be able to work with decimal numbers in calculations and to understand the order in which operations should be performed in those calculations.

Example Preview

Use the following body temperature data recorded on a patient taking fever-reducing medication to determine the patient's average body temperature for the week. The temperatures are in degrees Fahrenheit.

Day	Body Temperature (in °F)
Monday	103.1
Tuesday	102.6
Wednesday	101.0
Thursday	99.5
Friday	99.7
Saturday	99.2
Sunday	98.9

Solution

To find the average of the temperatures you must first add the temperature data values together. After adding the temperatures together, you then divide by 7 to get the average body temperature.

$$\frac{103.1+102.6+101.0+99.5+99.7+99.2+98.9}{7}=\frac{704}{7}\approx 100.6°F$$

1.R.3 Exercises

Concept Check

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.)

1. An estimate of the sum 71.369 + 49.1 is 120.

2. One way to estimate the product of decimal numbers is to round the numbers to the rightmost nonzero digit before performing the multiplication.

3. An estimate of the quotient $16.469 \div 3.87$ would be 4.

4. Experience and understanding are needed to decide whether or not a particular answer is reasonably close to an estimate.

5. According to the rules for order of operations, addition and subtraction should be performed before multiplication and division.

Practice

Estimate each answer, then find the actual answer. Round to the nearest hundredth, if necessary.

6.
$$\begin{array}{r} 29.03 \\ +\ 3.79 \\ \hline \end{array}$$

7.
$$\begin{array}{r} 51.21 \\ -\ 25.13 \\ \hline \end{array}$$

8. $(6.3)(1.6)$

9. $3.1\overline{)6.36}$

Simplify.

10. $8.6 \div 2.15 + 3.6 \cdot 20.3$

Applications

Solve.

11. ***Shipping:*** Jim is packing three sculptures in a box for shipping. The weights of the sculptures are 5.63 pounds, 12.4 pounds, and 3 pounds. The shipping materials weigh 17.4 pounds.

a. Estimate the total weight.

b. Find the actual weight.

12. ***Bicycling:*** Peter Sagan rode 125.09 miles in 5.35 hours.

a. Estimate how fast he was riding per hour.

b. What was his average speed per hour (to the nearest hundredth)?

13. ***Average Stock Price Change:*** Compute the average daily change in stock price over the course of 5 days if the following changes were recorded.

Day	Daily Net Change (Closing Price − Opening Price)
Monday	+25.88
Tuesday	−12.65
Wednesday	+10.31
Thursday	+15.47
Friday	−30.49

Writing & Thinking

14. Suppose you are only interested in an approximate answer for a product. Would there be any difference in the products produced by the following two procedures?

a. First multiply the two numbers as they are and then round the product to the desired place of accuracy.

b. First round each number to the desired place of accuracy and then multiply the rounded numbers.

Explain why you think these two procedures would produce the same result or different results.