1. Among American physicians, more are male than female. However, the ratio varies in different age groups. Use the table to answer parts (a)–(d).

\[ \text{American Physicians, Beginning of 1998} \]

\[
\begin{array}{cccc}
\text{Age Group} & \text{Male} & \text{Female} \\
<35 & 84,445 & 49,395 \\
35-44 & 152,210 & 61,192 \\
45-54 & 142,314 & 33,180 \\
55-64 & 92,260 & 12,022 \\
\end{array}
\]


Approximate each of the following ratios in three equivalent forms. Begin by rounding the given data to the nearest 5,000 to form the first ratios.

The ratio of male to female doctors in the
a. under 35 age group; b. 35–44 age group;

c. 45–54 age group; d. 55–64 age group.

2. Use the approximate ratio data on male and female physicians in example 1 to answer these questions. Express each answer in two equivalent forms—one a fraction and one a percent.

What fraction of physicians are females in the
a. under 35 years age group? b. 35–44 age group?

c. 45–54 age group? d. 55–64 age group?

3. Josh jogs an average of 8 miles per week for three weeks.

a. At this rate, how many miles will he jog in 52 weeks?

b. How many miles will he need to jog during the fourth week to bring his four-week average to 10 miles per week?
4. Tony can type at a constant rate of 55 words per minute.
   a. Write an equation for the number of words $W$ Tony can type in $T$ minutes.

   b. How many words can Tony type in 20 minutes?

   c. If Tony has a half hour to type a 1,600-word essay, will he have time to type the entire essay? Explain your reasoning.

5. The following table shows caffeine content of 12-ounce cans for five popular soft drinks.

### Caffeine Content in Milligrams

<table>
<thead>
<tr>
<th></th>
<th>12-Ounce Can</th>
<th>20-Ounce Bottle</th>
</tr>
</thead>
<tbody>
<tr>
<td>Diet Sun Drop</td>
<td>69</td>
<td></td>
</tr>
<tr>
<td>Mountain Dew</td>
<td>55</td>
<td></td>
</tr>
<tr>
<td>Dr. Pepper</td>
<td>41</td>
<td></td>
</tr>
<tr>
<td>Pepsi Cola</td>
<td>38</td>
<td></td>
</tr>
<tr>
<td>Coca-Cola</td>
<td>34</td>
<td></td>
</tr>
<tr>
<td>Barq’s Root Beer</td>
<td>22</td>
<td></td>
</tr>
</tbody>
</table>


a. Complete entries in the column giving caffeine content of 20-ounce bottles for each soft drink.

b. Compare caffeine content in the soft drinks above. In each case, use the exact data first. Then give a simpler ratio that is exactly or nearly equivalent to the first.

   i. Diet Sun Drop to Barq’s Root Beer

   ii. Mountain Dew to Dr. Pepper

   iii. Mountain Dew to Coca Cola
6. When people predict the chances that some athlete, team, racehorse, or car will win a competition, they often express their guess as a statement about the “odds against” winning. For example, they might predict that odds on the Yankees winning the World Series are 7 to 2, meaning that the probability of that event is \( \frac{2}{9} \). A horse that leaves the starting gate with odds 11 to 5 is predicted to have probability \( \frac{2}{16} \) of winning.

a. What is the probability that a team will win a game if the reported odds are 6 to 4? 8 to 5? 3 to 5? A to B?

b. What simpler odds statements could be given if the reported odds are 12 to 9? 8 to 2? 15 to 6?

c. What odds would be stated if the probability of winning a contest is \( \frac{2}{3} \), \( \frac{5}{8} \), \( \frac{4}{13} \), \( \frac{3}{B} \)?

7. A veterinarian’s clinic has a patient load of 150 cats and dogs. The ratio of cats to dogs is 4 to 8. How many patients are cats and how many are dogs? Explain your reasoning.

8. On a map, 1 centimeter = 50 kilometers. What is the actual distance between two towns that are 3.5 centimeters apart on the map? Explain your reasoning.
9. The numbers in the table are projections based on a 1993 survey of 10,000 households. The survey counted anyone 7 years old or older who participated in an activity more than once per year. Be ready to explain your strategies for answering parts (a)–(d).

<table>
<thead>
<tr>
<th>Activity</th>
<th>Males</th>
<th>Females</th>
<th>Ages 12–17</th>
<th>Ages 55–64</th>
</tr>
</thead>
<tbody>
<tr>
<td>Bicycle</td>
<td>24,562,000</td>
<td>23,357,000</td>
<td>8,794,000</td>
<td>2,030,000</td>
</tr>
<tr>
<td>Camping</td>
<td>23,165,000</td>
<td>19,533,000</td>
<td>5,336,000</td>
<td>2,355,000</td>
</tr>
<tr>
<td>Exercise walking</td>
<td>21,054,000</td>
<td>43,373,000</td>
<td>2,816,000</td>
<td>7,782,000</td>
</tr>
<tr>
<td>Fishing</td>
<td>30,449,000</td>
<td>14,885,000</td>
<td>4,945,000</td>
<td>3,156,000</td>
</tr>
<tr>
<td>Swimming</td>
<td>27,713,000</td>
<td>33,640,000</td>
<td>10,874,000</td>
<td>2,756,000</td>
</tr>
<tr>
<td><strong>Total in group</strong></td>
<td><strong>111,851,000</strong></td>
<td><strong>118,555,000</strong></td>
<td><strong>21,304,000</strong></td>
<td><strong>20,922,000</strong></td>
</tr>
</tbody>
</table>


a. Why don’t the numbers in the columns add to the given totals?

b. Is it fair to say that exercise walking is about twice as popular among females as among males? Use fractions, ratios, percents, or differences to support or contradict that claim.

c. Is it fair to say that swimming is about 4 times as popular among young people (ages 12–17) as among older people (ages 55–64)? Use fractions, ratios, percents, or differences to support or contradict that claim.

d. Can you compare the participation of teenage boys in these activities to the participation of older-adult women by using the data in the table?

e. The U.S. population in 1993 was about 258 million. In 2000 it was about 281 million. What projections of male and female participants in the five popular sports would you make for 2000?