

Star Cups Forever

Aina K. Appova

1. Fraction: $1/100$;
decimal: 0.01;
percentage: 1%

- 2.

$$\begin{aligned} 1/2,000,000 &= 0.00005\% \\ &= 0.0000005. \end{aligned}$$

Problem-solving processes will vary. Teachers should encourage reasoning rather than computations. For example, students may reason that

$$\begin{aligned} 100 \times 10,000 &= 1 \text{ million;} \\ 1 \text{ million} \times 2 &= 2 \text{ million.} \end{aligned}$$

For 2 million people:

$$\begin{aligned} 1\% \div 10,000 &= 0.0001\%; \\ 0.0001\% \div 2 &= 0.00005\%. \end{aligned}$$

3. The company will need to award 20,000 prizes.

4. $\$52,475 \times 20,000 =$
 $\$1,049,500,000$
(1 billion, 49 million, 500 thousand dollars).

5. This solution does not take into account the several leap years, which would occur in a span of 30 years.

$$\begin{aligned} (\$52,475 \div 30 \text{ yr.}) \div 365 \text{ d.} \\ \approx \$4.79 \text{ per day} \end{aligned}$$

6. $\$10 \text{ million} \div \$52,475 \approx 190$ prizes;
 $190 \div 2 \text{ million} = 0.000095$, or 0.0095%.

Solution: \$10 million will cover the award costs for 190 winners, which comprise 0.0095% of a 2 million customer population.

7. Solution for 1:

$$5/100 = 0.05 = 5\%;$$

solution for 2:

$$5/2,000,000 = 0.0000025 = 0.00025\%.$$

Teachers should encourage students to use multiple problem-solving strategies. For example, students might consider solving an easier problem with a smaller number of participants (a smaller

sample space): If 5 winners must be selected from 5 participants, then the chance of winning for each participant is guaranteed (5/5). Similarly, if 5 winners must be selected from 6 participants, then one combination will not include one participant. The goal is for students to recognize that, in this scenario, each participant has an equally likely chance of winning and the order in which the winners are selected does not make a difference. Students may need to make charts or tree diagrams to list the favorable outcomes versus the total number of outcomes to better understand why the answer would be the following:

$$\frac{5}{\text{total number of outcomes}}$$