

Section 3.3 Answers (Word Problems Adding Fractions)

39. A sports center has $\frac{4}{5}$ of its total area devoted to seating of fans and guests. If $\frac{3}{8}$ of the seating area is used for general admission seating and the rest for reserved seating, find the fraction of the total area used for reserved seating.

Answer. This question is ambiguous—it has two reasonable meanings.

In the first meaning, $\frac{4}{5}$ of the total seating area is for fans and guests, and the other $\frac{1}{5}$ is seating area other people such as reporters and staff. In that case, taking away the $\frac{3}{8}$ general admission from the $\frac{4}{5}$ for fans and guests, we have

$$\frac{4}{5} - \frac{3}{8} = \frac{4 \cdot 8}{5 \cdot 8} - \frac{3 \cdot 5}{8 \cdot 5} = \frac{32}{40} - \frac{15}{40} = \frac{17}{40}$$

so the answer is that reserved seating is $\frac{17}{40}$ of total area.

In the second meaning, $\frac{4}{5}$ of the total area is seating area for fans and guests, and the other $\frac{1}{5}$ is for other uses such as equipment or storage. In that case, $\frac{3}{8}$ of the seating area for general admission would be $(\frac{3}{8})(\frac{4}{5})$ of the total area, leaving $(\frac{5}{8})(\frac{4}{5})$ of the total area for reserved seating.

$$\frac{5}{8} \cdot \frac{4}{5} = \frac{5 \cdot 4}{8 \cdot 5} = \frac{20}{40} = \frac{1}{2},$$

so the answer is that reserved seating is $\frac{1}{2}$ of total area.

43. Bill Newton is a general contractor. He began a job with $\frac{3}{4}$ of a tank of fuel in his backhoe. He used $\frac{1}{3}$ of the tank in the morning and $\frac{3}{8}$ of the tank in the afternoon. What fraction of the tank of fuel remains?

Answer. The job starts with $\frac{3}{4}$ of a tank. In the morning, $\frac{1}{3}$ is subtracted. $\frac{3}{4} - \frac{1}{3}$ is the same as $\frac{9}{12} - \frac{4}{12}$, so $\frac{5}{12}$ is left. Then in the afternoon, $\frac{3}{8}$ is subtracted. $\frac{5}{12} - \frac{3}{8}$ is the same as $\frac{40}{96} - \frac{36}{96}$, which is $\frac{4}{96}$, which is $\frac{2}{48}$, which is $\frac{1}{24}$, so the fraction of fuel that remains is $\frac{1}{24}$ of a tank.