



Problem of the Week

Problem C and Solution

Motoring Along

Problem

In a traffic study done on a busy highway, it was found that 40% of all cars contained two or more people. Of those cars containing only one person, 25% of these people were NOT wearing sunglasses. Determine the percentage of all cars which contained exactly one person and that person was wearing sunglasses.

Solution

Solution 1

Let's suppose there were 100 cars on the highway.

If 40% of the cars contained two or more people, that means that $0.4 \times 100 = 40$ cars contained two or more people. Therefore, $100 - 40 = 60$ cars contained exactly one person (a car cannot be moving on a highway if there is less than 1 person in it!).

Of the cars containing only one person, 25% of these people were NOT wearing sunglasses. Therefore, there are $0.25 \times 60 = 15$ cars with only one person and that person was NOT wearing sunglasses and $60 - 15 = 45$ with only one person and that person was wearing sunglasses.

Therefore, the percentage of all cars which contained exactly one person and that person was wearing sunglasses was $\frac{45}{100} \times 100\% = 45\%$.

Solution 2

If 40% of the cars contained two or more people, then 60% of the cars contained one person.

Of the cars containing only one person, 25% of these people were NOT wearing sunglasses. Therefore, of the cars containing only one person, 75% of these people were wearing sunglasses.

Since $0.75 \times 0.60 = 0.45$, 45% of all cars contained exactly one person and that person was wearing sunglasses.

