

Solution - Challenge of the Week

Challenge of the Week # 5 - September 25 to October 2, 2009

One hundred people live in a small village. Some of them are truth tellers, who always tell the truth, and the others are liars, who never tell the truth. Each person owns exactly one vehicle — a van, a pickup, or a sedan. Each person was asked three questions. Each person answered each question with either 'yes' or 'no'.

1. Do you own a van?
2. Do you own a pickup?
3. Do you own a sedan?

Sixty people answered 'yes' to the first question, forty answered 'yes' to the second question and thirty answered 'yes' to the third question. How many liars are there in the village?

Correct solutions from Alex Felton, Joseph Leipert, Alex Meadows, Allen Obendorf, William Petersen, Jaimee Phegley, Ryan Sampson, Allysha Schuster, Ashlee Sharp, and Dustin Trosper, Cydnee Tucker. Other submissions from Kristen Drozky, Jessica Eriks, and Seth Oritano

Solution: Each liars gave two yes answers and one no answer. Each truth teller gave one yes answer and two no answers. If L is the number of liars and T is the number of truth tellers, then, since, there are 130 yes answers,

$$2L + T = 130.$$

Since there are 100 people in the village,

$$L + T = 100.$$

Subtracting these two equations gives that there are 30 liars in the village.