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## Problem of the Week

### Solution Nine

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When they started off on the great annual picnic every wagon in town was pressed into service.

Half way to the picnic ground ten wagons broke down, so it was necessary for each of the remaining wagons to carry one more person.

When they started for home it was discovered that fifteen wagons were out of commission, so on the return trip there were three persons more in each wagon than when they started out in the morning.

Now who can tell how many people attended the great annual picnic?

**SOLUTION:** I have presented this problem precisely as Loyd presented it, but it seems to me we must assume that every wagon carried the same number of people at the start. That is strongly implied in the problem's statement, but it is not explicitly stated. Given that assumption, however, the problem now yields to a bit of algebra.

So, let  $x$  be the number of people in any given wagon when they started out in the morning, and let  $y$  denote the number of wagons at the start. We know that the number of people displaced by ten wagons breaking down is exactly equal to the number of remaining wagons. Therefore:

$$10x = y - 10.$$

We then learn that an additional fifteen wagons have broken down. It follows that the total number of people displaced is now  $25x$ , and this number must be equal to three times the number of remaining wagons. Therefore:

$$25x = 3(y - 25)$$

$$25x = 3y - 75$$

That gives us the system of equations:

$$10x = y - 10$$

$$25x = 3y - 75$$

It is now easy to solve these equations simultaneously, leading to the conclusion that

$$x = 9 \quad y = 100.$$

It follows that the total number of people at the picnic was 900. Big picnic!