

2006 Primary Set 2 solutions

- P2.1.** Four very hungry children were given a plate of cakes. Alfred ate one quarter of the cakes on the plate. Beatrice ate one third of the remaining cakes. Then Catriona ate half of the cakes that were left and finally, Douglas ate the six cakes that were left. How many cakes were on the plate at the start and how many did each child eat?

Solution

Alfred ate one quarter of the cakes; Beatrice ate $\frac{1}{3}$ of $\frac{3}{4}$ i.e. $\frac{1}{4}$; so there were $\frac{1}{2}$ of the cakes left. Catriona ate one quarter of the cakes, leaving one quarter for Douglas. As we know that Douglas ate 6 cakes there must have been 24 cakes initially and it transpires that each of the children ate 6 cakes.

- P2.2.** Fifteen strangers met for dinner. Before sitting down, each person shook hands with everyone else at the meal. How many hand shakes were there?

After they sat down at a round table, each person clinked glasses with the person on his immediate left and immediate right. How many times in total did glasses clink?

Solution

- (a) The first person shakes hands with 14 others, the next with the 13 others and so on. So the total is $14 + 13 + 12 + \dots + 2 + 1 = 105$. Thus the total number of hand shakes is 105.
- (b) Each clinks with 2 others but this included A clinking with B as well as B clinking with A, so the total is $\frac{1}{2} \times 2 \times 15 = 15$.

OR

To avoid duplicates, count the number of clinks with the person on the left.

P2.3. Many years ago, in a far off country, a lord invited all his workers to a Christmas celebration in his castle. George and Beryl set off at 11 a.m., travelling by horse and cart. At 11 30 a.m., Beryl asked how far they had gone. George replied that they would stop at an inn for lunch soon and that they had already travelled three times as far as the distance still to go to the inn.

After lunch, the couple left the inn at 1 p.m. and, having overeaten, George drove more slowly than before. After an hour, exactly 2 miles from where she had asked her first question, Beryl asked if they had much further to go. George mumbled, “Three times as far as we have come since leaving the inn.”

Beryl took over the driving and they arrived at the castle at 3.30 p.m., in good time for the party.

What was the total distance that the couple had to travel to reach the castle?

Solution

Use a diagram : Total distance = 8 miles

Times are an irrelevant distraction!

