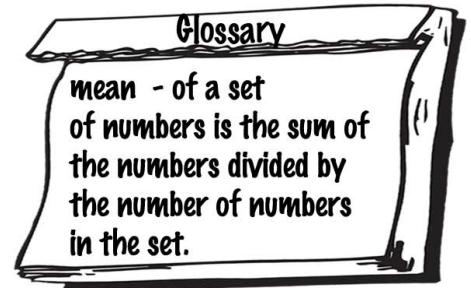## Problem

Buster, Billy, Bobby, and Belinda have been collecting Nascar action figures. Buster has 23 figures, Billy has 36, Bobby has 15, and Belinda has 34.

a) What is the mean number of action figures owned by the four people?

b) Some time later, they have collected more figures. Now Buster has 27, Billy has 38, and Bobby has 20. If the mean number of figures is now 30, how many figures does Belinda have?

c) How many more figures will they have to collect in total to have a mean of 32 figures?

> **Glossary**
>
> **mean** - of a set of numbers is the sum of the numbers divided by the number of numbers in the set.

Extension :

1. Suppose the four friends have a mean of 27 figures.
   Which of the following statements could be true? (Explain your answers.)

   a) Two of them have over 50 figures each.

   b) Two of them each have an even number of figures.

   c) One of them has only 9 figures.

Hints

Part b)

Hint 1 - If the average number of figures owned is 30 per person, how many figures do the four children own in total?

Part c)

Hint 1 - If the average number of figures owned is 32 per person, how many figures would the four children have to own in total?

Extension :

Hint 1 - If the average number of figures owned is 27 per person, how many figures would the four children own in total?

Hint 2 - What is the total number of figures owned by Billy-Bob and Buffy-Sue?

Solution

a) Since all together they have $23 + 36 + 15 + 34 = 108$ action figures, the four people have an average of $108 \div 4 = 27$ figures each.

b) If they have an average of 30 figures each, then all together, the four people have a total of $30 \times 4 = 120$ action figures. Thus Buffy-Sue now has $120 - (27 + 38 + 20) = 35$ figures.

c) To have an average of 32 figures each, the four people must have a total of $32 \times 4 = 128$ action figures. There are two possible answers to this question: if you assume the previous total from part a), they need $128 - 108 = 20$ more figures; however, if you assume the previous total from b), they will need $128 - 120 = 8$ more figures.

Extension :

All of the given statements could be true. The total number of figures is $27 \times 4 = 108$. Thus, for a), the friends could have, say, 50, 50, 2, and 6 figures each. A distribution of 40, 40, 19, and 9 shows b) and c) could be true.