

### Questions from Mrs. Low (16 Feb)

1. Ann and Ben have some beads. If Ann gives Ben 30 beads, both will have the same number of beads. If Ben gives Ann 30 beads, the ratio of Ann's beads to that of Ben will be 3 : 1. How many beads has Ann?

#### Solution:

If Ann gives Ben 30 beads,

$$\begin{array}{l} \text{Actual} \quad \underline{A} : \underline{B} \\ \quad \quad \quad ? \\ \text{Result} \quad -30 : +30 \\ \quad \quad \quad 1 \text{ unit} : 1 \text{ unit} \rightarrow 2 \text{ units} \\ \quad \quad \quad \downarrow \times 2 \quad \downarrow \times 2 \quad \downarrow \times 2 \\ \quad \quad \quad 2 \text{ units} : 2 \text{ units} \rightarrow 4 \text{ units} \end{array}$$

If Ben gives Ann 30 beads,

$$\begin{array}{l} \text{Actual} \quad \underline{A} : \underline{B} \\ \quad \quad \quad ? \\ \text{Result} \quad +30 : -30 \\ \quad \quad \quad 3 \text{ units} : 1 \text{ unit} \rightarrow 4 \text{ units} \end{array}$$

Ann has (2 units + 30) beads.

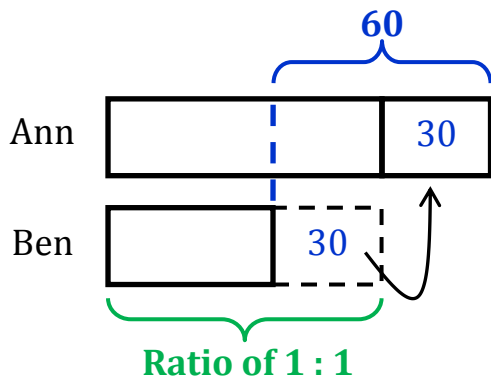
Ann has (3 units - 30) beads.

$$\begin{array}{l} 2 \text{ units} + 30 \rightarrow 3 \text{ units} - 30 \\ 1 \text{ unit} \rightarrow 60 \end{array}$$

$$2 \text{ units} + 30 \rightarrow 150 \quad \text{or} \quad 3 \text{ units} - 30 \rightarrow 150$$

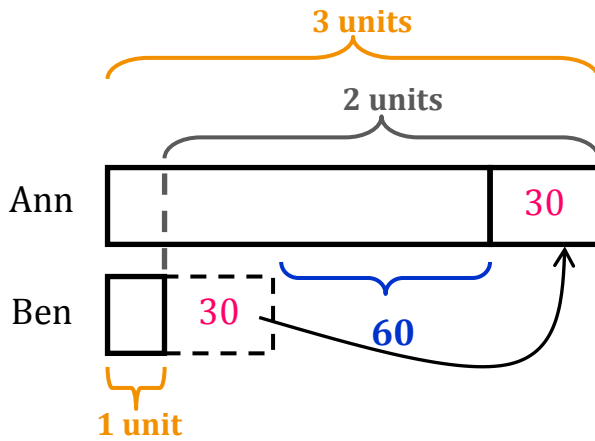
**Ans: 150 beads**

**Alternative:**



Actually, Ann has 60 more beads than Ben.

Using this information in the next case where Ben gives Ann 30 beads,



$$\begin{aligned} 2 \text{ units} &\rightarrow 60 + 30 + 30 = 120 \\ 1 \text{ unit} &\rightarrow 60 \end{aligned}$$

$$1 \text{ unit} + 90 \rightarrow 60 + 90 = 150 \quad \text{or} \quad 3 \text{ units} - 30 \rightarrow 180 - 30 = 150$$

**Ans: 150 beads**

2. Carl and Don had some money. 50% of Carl's money is \$450 more than  $\frac{1}{5}$  of Don's money. If they had a total of \$3490, how much had Carl?

**Solution:**

Carl's money : 2 units

Don's money : 5 parts

$$50\% = \frac{1}{2}$$

$$\begin{array}{l}
 1 \text{ unit} \rightarrow 1 \text{ part} + \$450 \\
 \downarrow \times 2 \qquad \downarrow \times 2 \qquad \downarrow \times 2 \\
 2 \text{ units} \rightarrow 2 \text{ parts} + \$900
 \end{array}$$

Total amount:  $2 \text{ units} + 5 \text{ parts} \rightarrow \$3490$

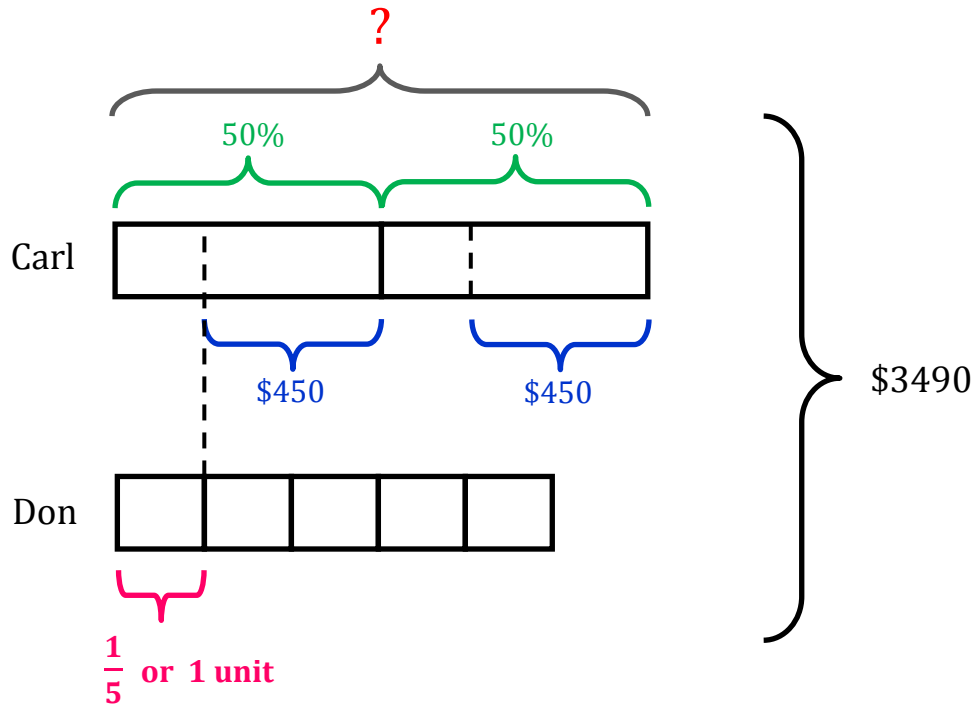
$$\begin{array}{l}
 2 \text{ parts} + \$900 + 5 \text{ parts} \rightarrow \$3490 \\
 7 \text{ parts} \rightarrow \$2590 \\
 1 \text{ part} \rightarrow \$370
 \end{array}$$

$$\begin{array}{l}
 1 \text{ unit} \rightarrow \$370 + \$450 = \$820 \\
 2 \text{ units} \rightarrow \$1640
 \end{array}$$

**Ans: \$1640**

**Alternative:**

$$50\% = \frac{1}{2}$$



$$7 \text{ units} \rightarrow \$3490 - \$450 - \$450 = \$2590$$

$$1 \text{ unit} \rightarrow \$370 \left( \frac{1}{5} \text{ of Don's money} \right)$$

$$2 \text{ units} + \$450 + \$450 \rightarrow \$1640$$

**Ans: \$1640**