

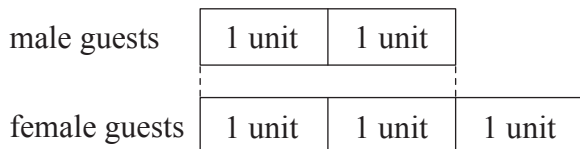
Fractions

EXAMPLE

At a party, 2 free drinks were given to each male guest and 3 free drinks were given to each female guest. $\frac{3}{5}$ of the guests were female. How many female guests were there at the party if a total of 936 free drinks were given to the guests?

Solution:

Units representing number of male and female guests:



Since each male guest was given 2 free drinks and each female guest was given 3 free drinks, we can find the number of units representing the free drinks:

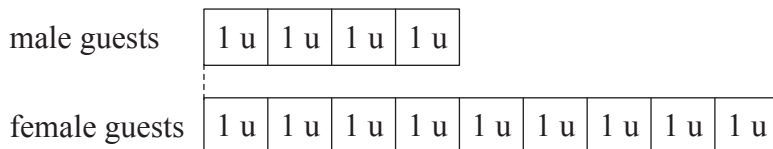
Number of free drinks (in units) given out to male guests

$$\rightarrow 2 \text{ u} \times 2 \text{ free drinks} = 4 \text{ u}$$

Number of free drinks (in units) given out to female guests

$$\rightarrow 3 \text{ u} \times 3 \text{ free drinks} = 9 \text{ u}$$

Units representing number of free drinks for male and female guests:



Total units representing number of free drinks given out $\rightarrow 4 \text{ u} + 9 \text{ u} = 13 \text{ u}$

$13 \text{ u} \rightarrow 936 \text{ free drinks}$

$1 \text{ u} \rightarrow ? \text{ free drinks}$

$$936 \div 13 = 72$$

Next, find the number of female guests at the party:

$$72 \times 3 = 216$$

There were **216** female guests at the party.

PRACTICE

- 1 There were 1870 seats in Theatres A and B. $\frac{3}{5}$ of the seats in Theatre A and $\frac{5}{6}$ of the seats in Theatre B were occupied. There were an equal number of empty seats in Theatres A and B. How many more seats were there in Theatre B than Theatre A?

- 2 David collected some seashells. He gave $\frac{2}{5}$ of them to his brother and $\frac{4}{9}$ of the remaining seashells to his sister. He then collected another 38 seashells. How many seashells did David collect at first if he had 123 seashells in the end?

- 3 In January, Mr Lee spent $\frac{1}{3}$ of his salary on transport, $\frac{1}{2}$ of it on food and saved $\frac{1}{6}$ of his salary. His salary increased in February and he increased his savings by $\frac{2}{5}$ of his previous savings. He saved \$462 in February.
- (a) How much was Mr Lee's savings in January?
- (b) How much was Mr Lee's salary in January?
- (Assume that he spent the same amount on transport and food in both months.)*

Solutions to:

Fractions

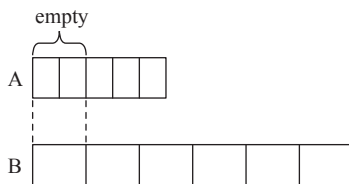
1. Since $\frac{3}{5}$ of the seats in Theatre A and $\frac{5}{6}$ of the seats in Theatre B were occupied, we need to find the fraction of empty seats for both Theatres A and B.
 Fraction of seats in Theatre A that were empty

$$\begin{aligned} &\rightarrow 1 - \frac{3}{5} \\ &= \frac{5}{5} - \frac{3}{5} \\ &= \frac{2}{5} \end{aligned}$$

Fraction of seats in Theatre B that were empty

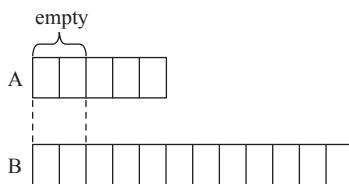
$$\begin{aligned} &\rightarrow 1 - \frac{5}{6} \\ &= \frac{6}{6} - \frac{5}{6} \\ &= \frac{1}{6} \end{aligned}$$

Since there were an equal number of empty seats in Theatres A and B, the model diagrams are drawn as shown:



Each of Theatre B's units is divided into 2 smaller units.

The model diagrams are now as shown:



We can see that:

- Theatre A has a total of 5 units
- Theatre B has a total of 12 units

We can now find the total number of units for Theatres A and B:

$$5 \text{ units} + 12 \text{ units} = 17 \text{ units}$$

We can also find the number of seats represented by 1 unit in Theatres A and B since there were 1870 seats:

$$17 \text{ units} \rightarrow 1870 \text{ seats}$$

$$1 \text{ unit} \rightarrow ? \text{ seats}$$

$$1870 \div 17 = 110$$

We can find the number of seats in Theatre A:

$$1 \text{ unit} \rightarrow 110 \text{ seats}$$

$$5 \text{ units} \rightarrow ? \text{ seats}$$

$$110 \times 5 = 550$$

We can find the number of seats in Theatre B:

$$1 \text{ unit} \rightarrow 110 \text{ seats}$$

$$12 \text{ units} \rightarrow ? \text{ seats}$$

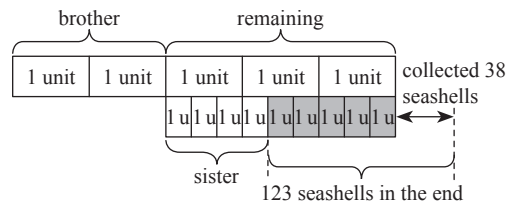
$$110 \times 12 = 1320$$

Lastly, we can find the difference in the number of seats in Theatres A and B:

$$1320 - 550 = 770$$

There were **770** more seats in Theatre B than Theatre A.

- 2.



From the model diagram, we can see that 5 u and 38 seashells is equal to 123 seashells in the end. We can find the number of seashells represented by 1 u:

$$5 \text{ u} + 38 \rightarrow 123$$

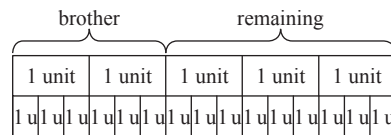
$$5 \text{ u} \rightarrow 123 - 38$$

$$= 85$$

$$1 \text{ u} \rightarrow 85 \div 5$$

$$= 17$$

Since 1 unit is divided into 3 u, the model diagram is drawn as shown:



We can now find the number of seashells David collected at first:

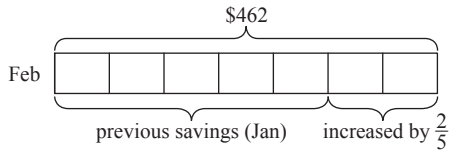
$$1 \text{ u} \rightarrow 17 \text{ seashells}$$

$$15 \text{ u} \rightarrow ? \text{ seashells}$$

$$17 \times 15 = 255$$

David collected **255** seashells at first.

3. (a)



$$7 \text{ u} \rightarrow \$462$$

$$1 \text{ u} \rightarrow \$462 \div 7$$

$$= \$66$$

$$5 \text{ u} \rightarrow \$66 \times 5$$

$$= \$330$$

Mr Lee's savings in January was **\$330**.

(b) $\frac{1}{3}$ of his salary on transport

$$= \frac{4}{12} \text{ of his salary on transport}$$

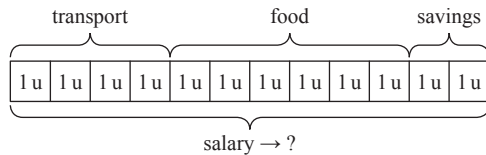
$\frac{1}{2}$ of his salary on food

$$= \frac{6}{12} \text{ of his salary on food}$$

$\frac{1}{6}$ of his salary saved

$$= \frac{2}{12} \text{ of his salary saved}$$

$$= \$330$$



Since 2 u represents \$330, which is the amount saved, we can find the amount represented by

1 u:

$$2 \text{ u} \rightarrow \$330$$

$$1 \text{ u} \rightarrow ?$$

$$\$330 \div 2 = \$165$$

We can now find Mr Lee's salary in January:

$$1 \text{ u} \rightarrow \$165$$

$$12 \text{ u} \rightarrow ?$$

$$\$165 \times 12 = \$1980$$

Mr Lee's salary in January was **\$1980**.