

# USING BAR MODELS TO SUPPORT LEARNING

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# Why use bar models

- Show the problem visually
- Quick and easy to draw
- Helps children visualise what to do

- Top tips:

Bar models are used to show which operation to use.

They do not give you the answer.

Bar should be drawn in proportion to each other. E.g. it depends on the numbers

Bar models serve as the **pictorial bridge** between hands-on learning and abstract problem-solving.

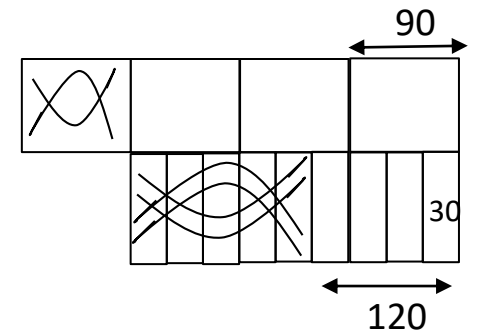
Mr Yap had a length of rope.

He used  $\frac{1}{4}$  of it to tie some boxes together.

He then used  $\frac{5}{9}$  of the remainder to make a skipping rope for his daughter.

120cm of rope were left.

What was the length of rope used to tie the boxes together?



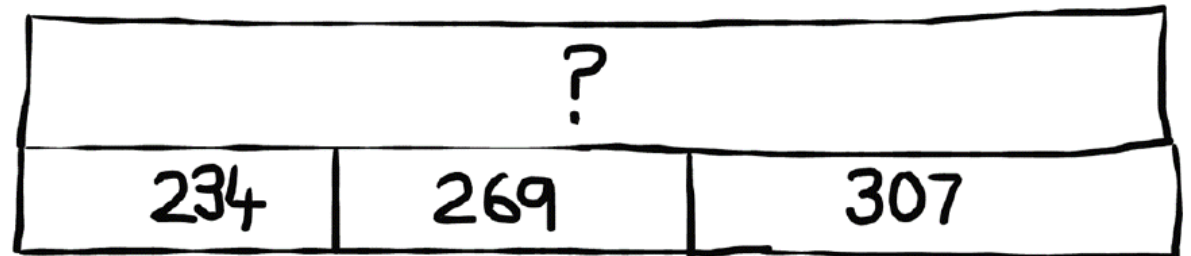
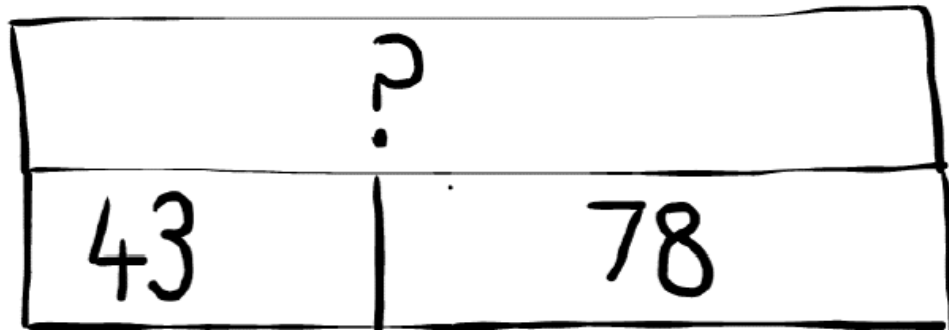
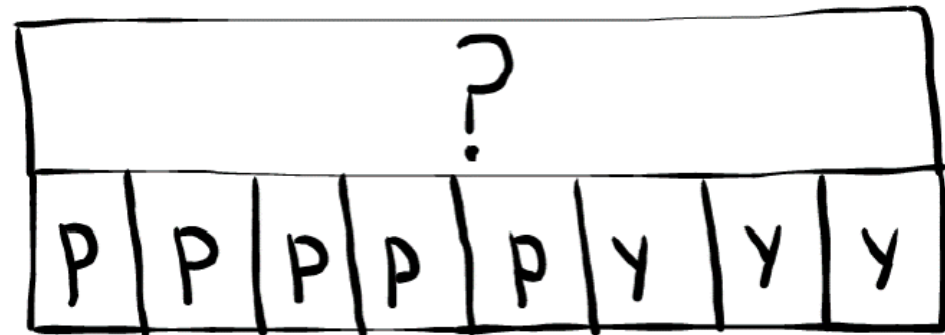
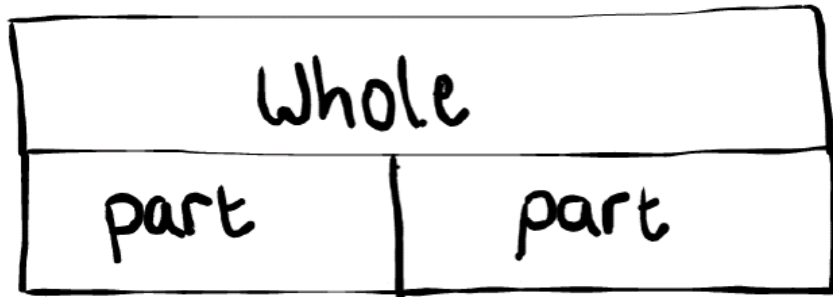
# The basics



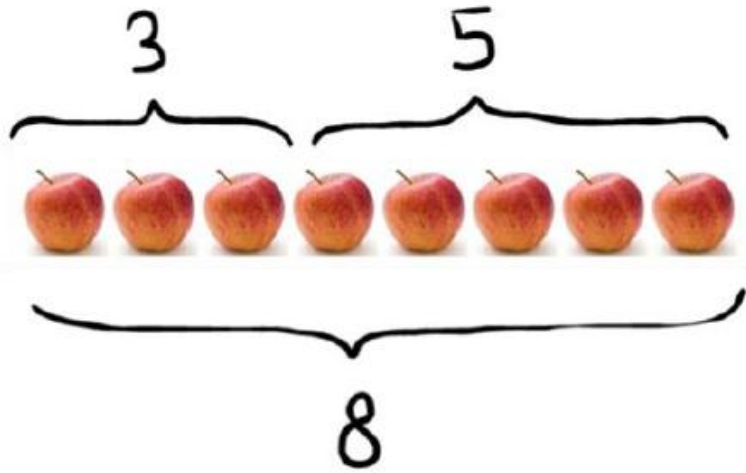
The length of bar  
represents the  
quantity

The location of the  
bar shows us how  
the quantities  
relate to each other

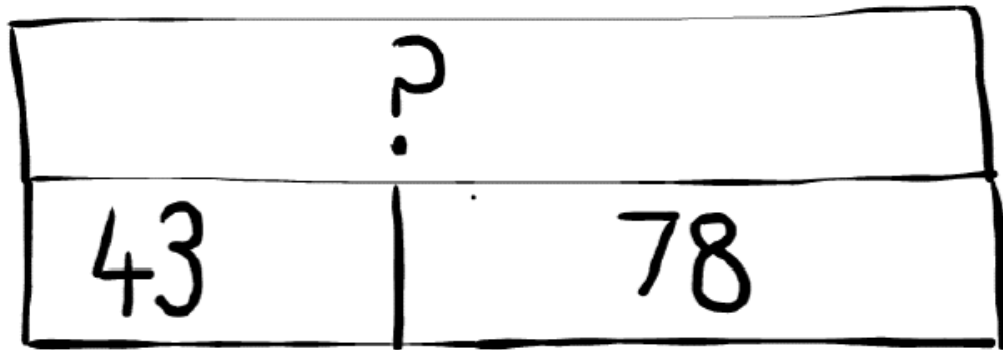
# Part/whole bar models



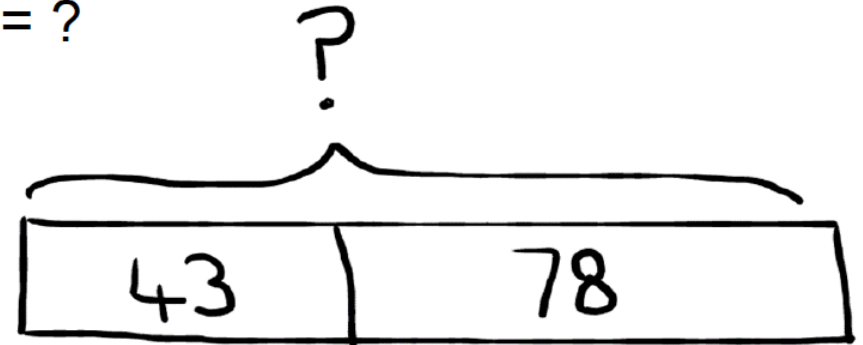
# KS<sub>1</sub> bar model



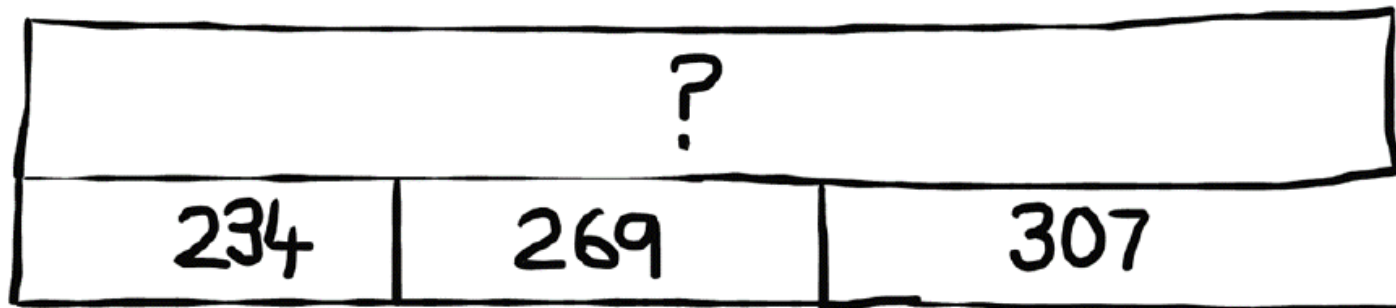
# Addition



$43 + 78 = ?$



$234 + 269 + 307 = ?$



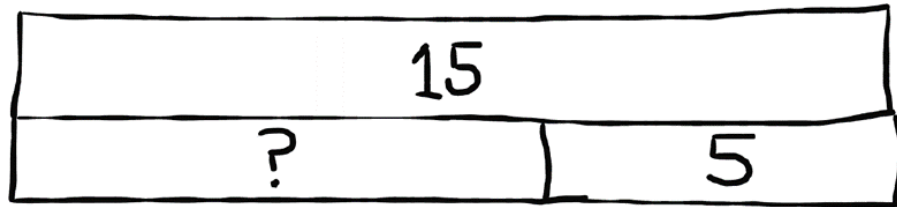
Your turn

$$450 + 350 = ?$$

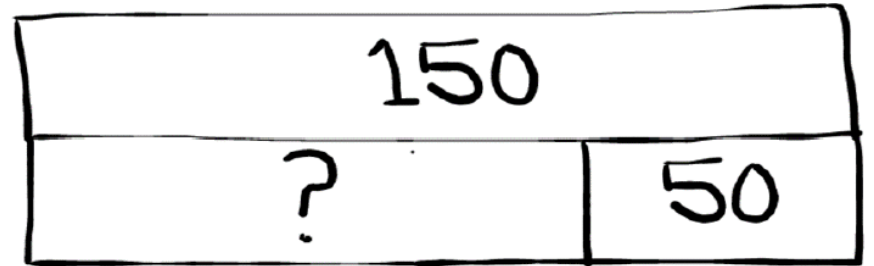
$$5 + 9 + 12 = ?$$

# Subtraction

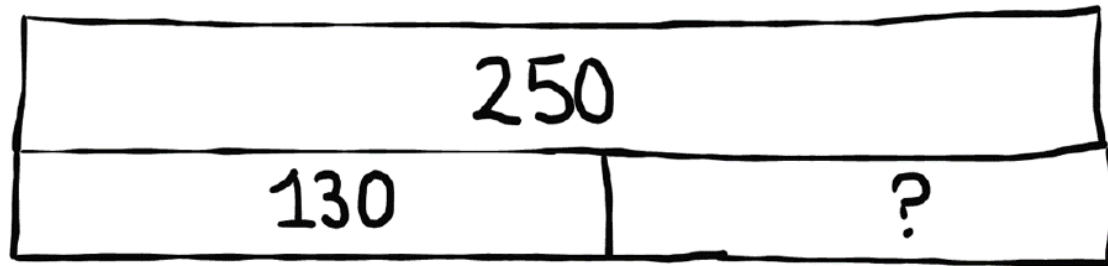
$15 - 5 = ?$



$150 - 50 = ?$



$250 - ? = 30$



Your turn

$$965 - 345 = ?$$

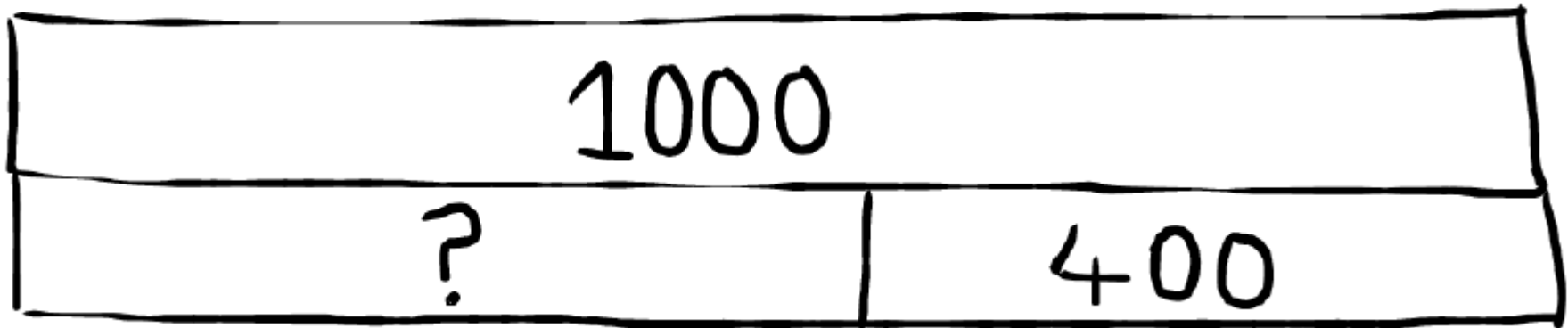
$$? + 45 = 100$$

$$75 - ? = 25$$

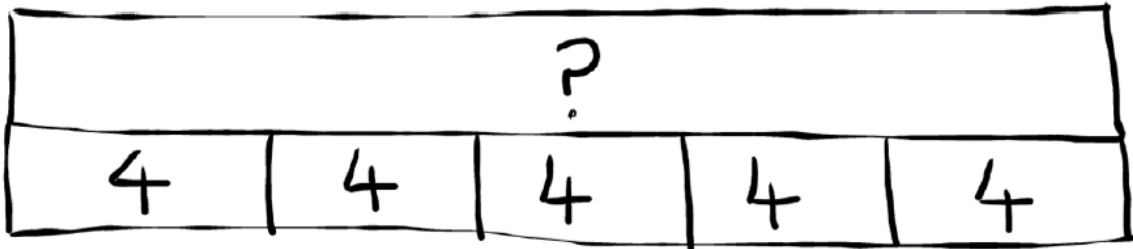
# Missing number problems

- These often look like subtraction bar models because of the missing number

$$400 + ? = 1000$$

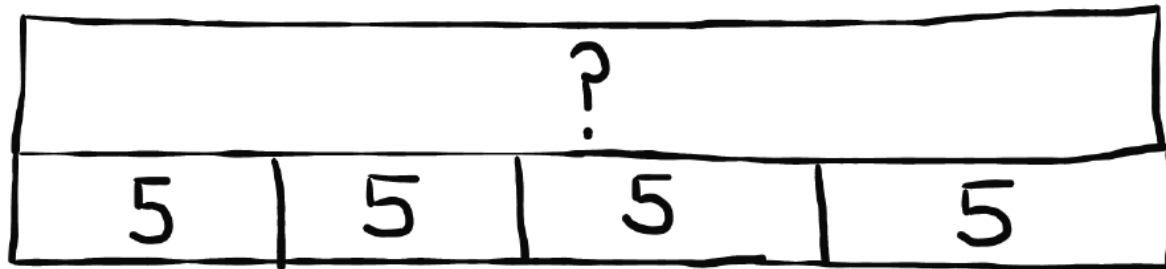


# Multiplication and division



As a number sentence

$$5 \times 4 = ?$$



Whereas this number sentence is

$$4 \times 5 = ?$$

Your turn

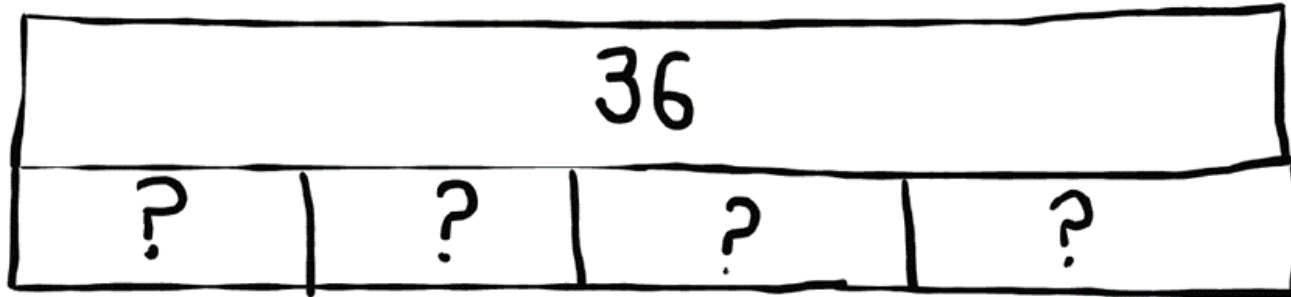
$$3 \times 6 =$$

$$6 \times 3 =$$

# Division

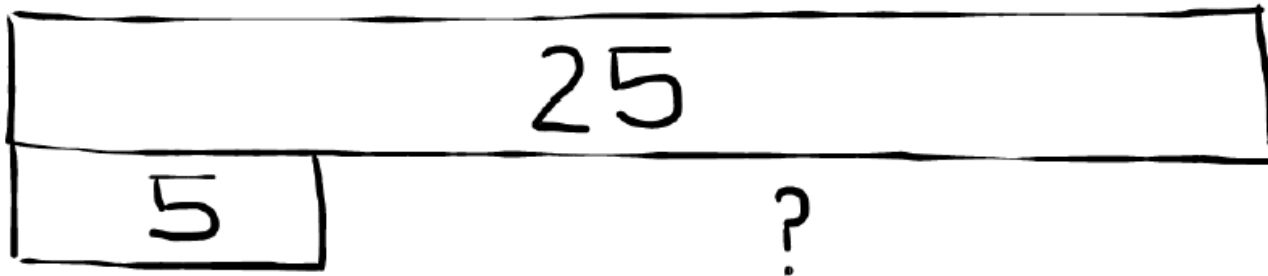
$36 \div 4 = ?$

$4 \times ? = 36$



$? \times 5 = 25$

$25 \div 5 = ?$



## Your turn

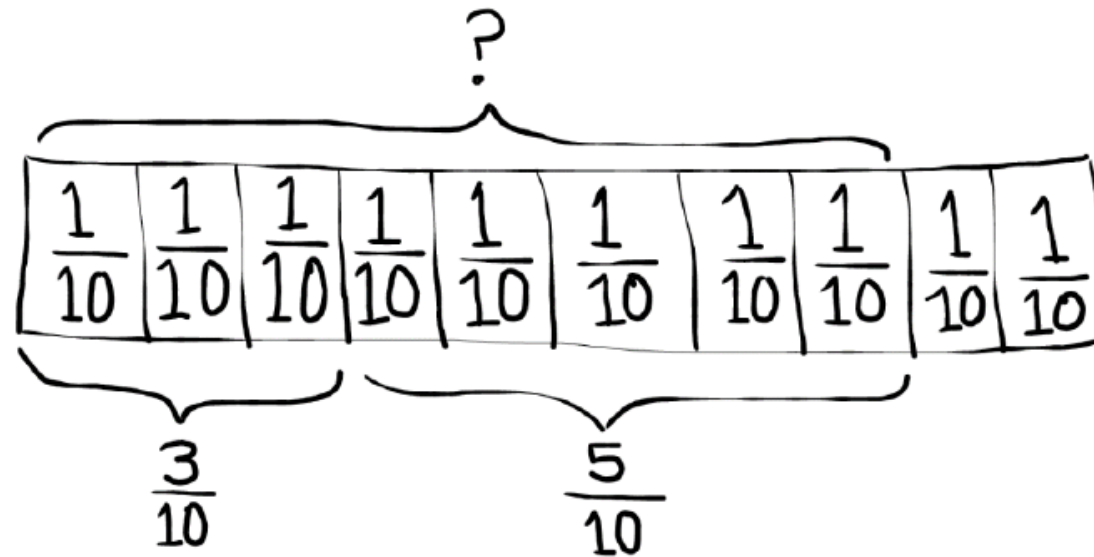
$$54 \div 9 = ?$$

$$5 \times ? = 35$$

$$? \times 2 = 10$$

# Fractions

In Year 3, children start adding fractions with the same denominator such as  $\frac{3}{10} + \frac{5}{10} = ?$

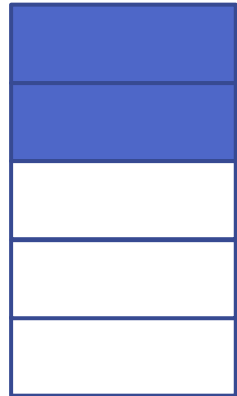
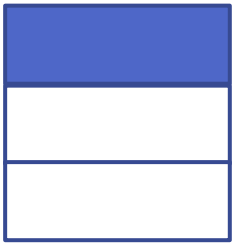


Your turn

$$\frac{3}{5} + \frac{1}{5} =$$

# Adding fractions with different denominators

$$1/3 + 2/5 = ?$$

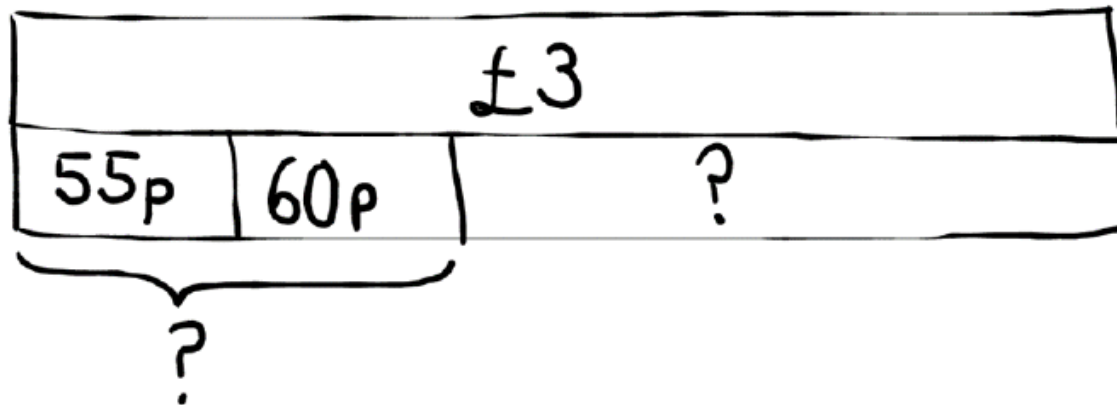


# Fractions of amounts

# Money

These types of bar models are known as continuous because each box represents a value and not a single digit.

A boy has £3. He buys some crisps for 55p and a chocolate bar for 60p. How much change does he get?

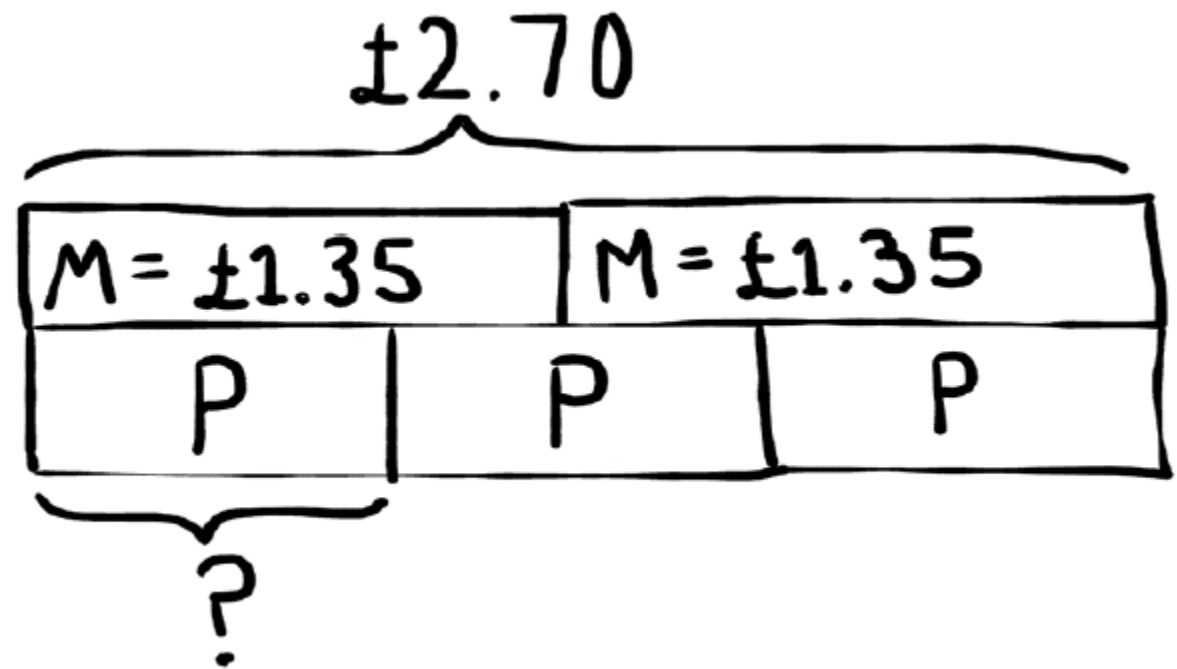


# Money

3 pineapples cost the same as 2 mangoes.

1 mango costs £1.35.

How much does one pineapple cost?



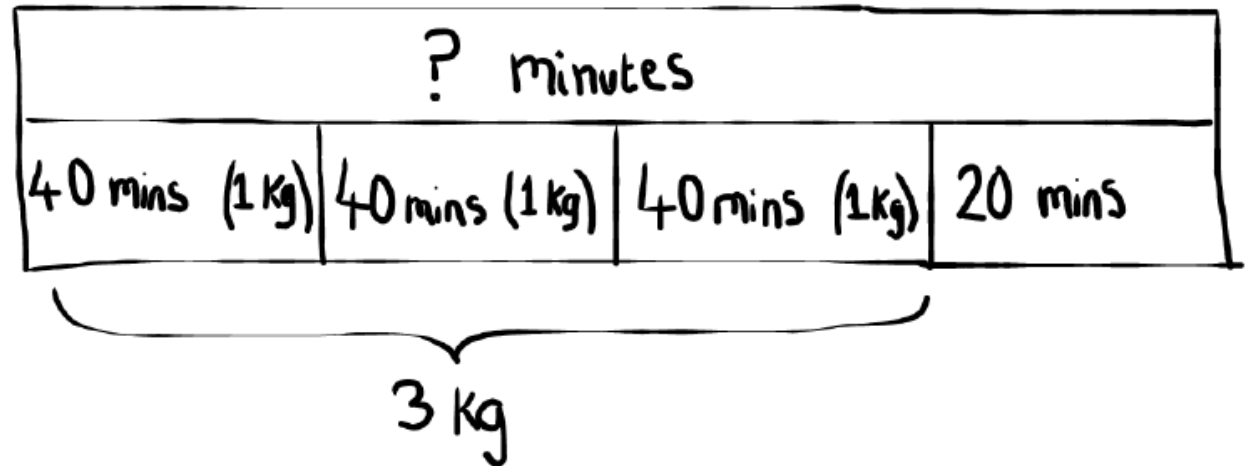
# Time and duration

Here is a rule for the time it takes to cook a chicken.

Cooking time = 20 minutes plus an extra  
40 minutes for each kilogram

How many minutes will it take to cook a 3 kg chicken?

minutes

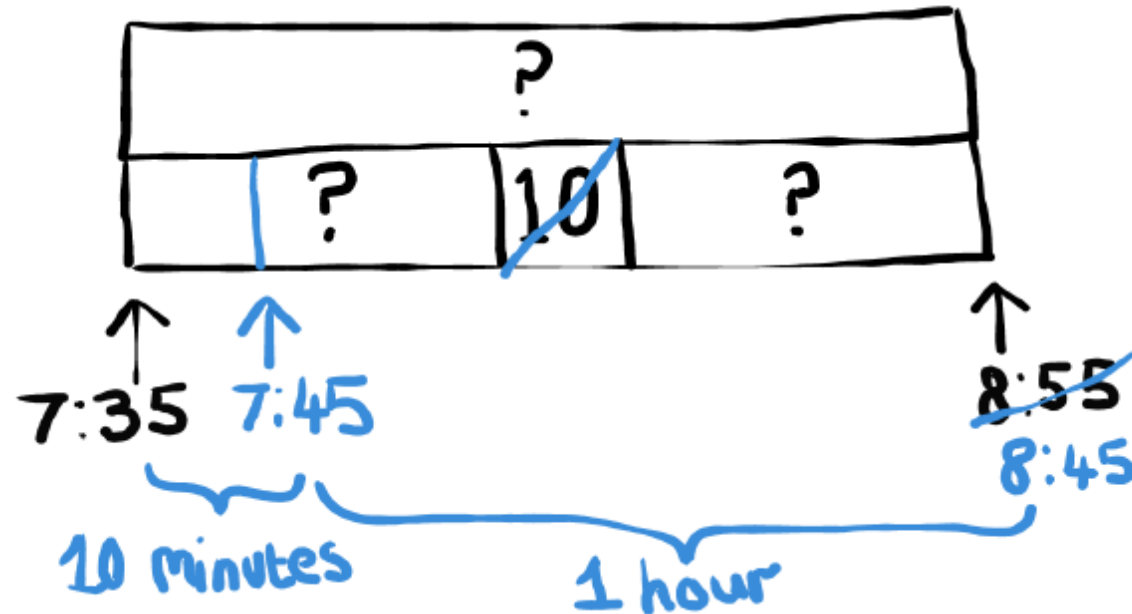


# Time and duration

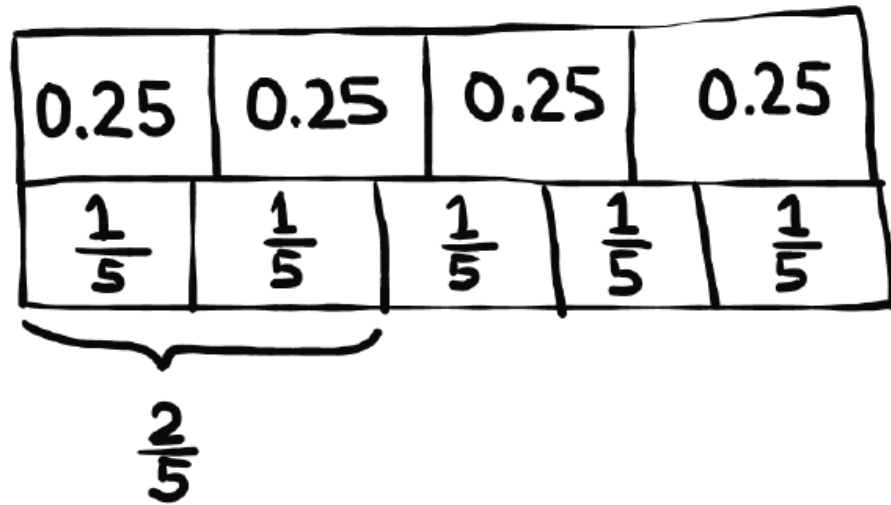
A film starts at 7:35 pm and ends at 8:55 pm.

There is an ice cream break of 10 minutes halfway through

How long is the film?



# Bar models to show explanations



20

Adam says,

0.25 is **smaller** than  $\frac{2}{5}$

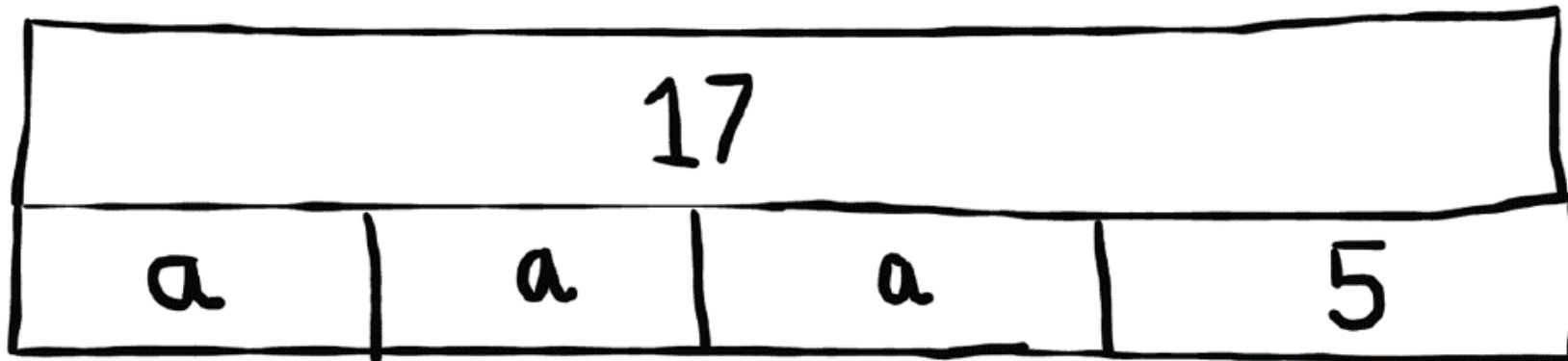


Explain why he is correct.

# Algebra

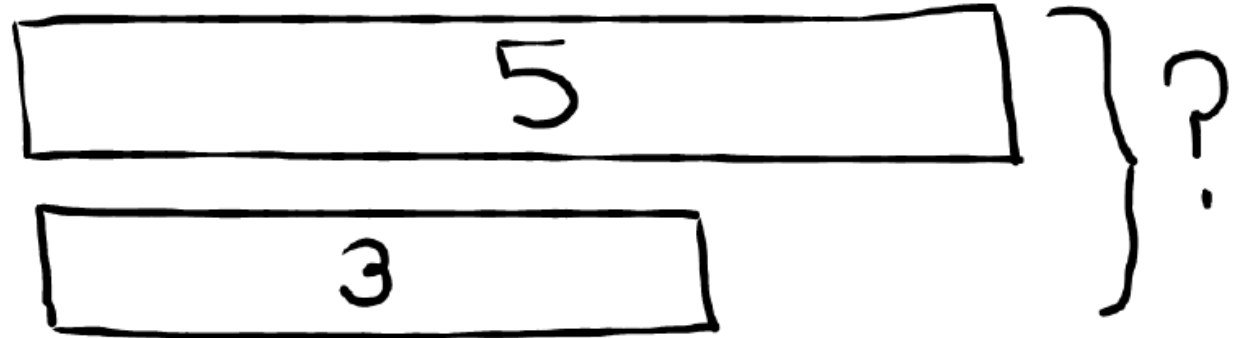
Solve...

$$3a + 5 = 17$$

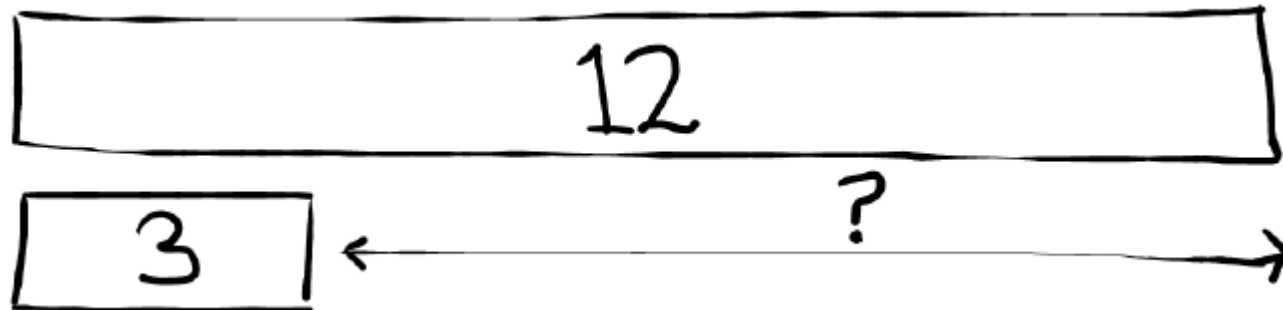


# Comparison bar models

Addition  $5 + 3 = ?$



Sandi has 12 football cards and Umar has 3.  
How many more cards does Sandi have than Umar?



# Ratio

Shannon and Amir share £56 in the ratio of 3:5.  
How much money does each person get?



# Ratio

90 sweets are shared between three bowls (a, b and c) in the ratio of 1:2:3.

How many more sweets does bowl b have than bowl a?

