

Percentage Problem

Starter

- A pair of trainers costs £36 in the sale.
- How much did they cost originally?

20% discount



Solution?

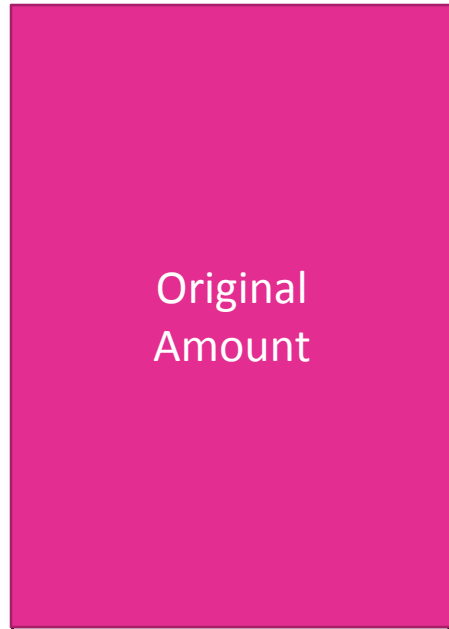
- Did you say £43.20?
- Did you say £45.00?

- Who is right? Why?

Let's make percentage blocks!

Picture this ...

The original amount can be split into 5 parts of 20%



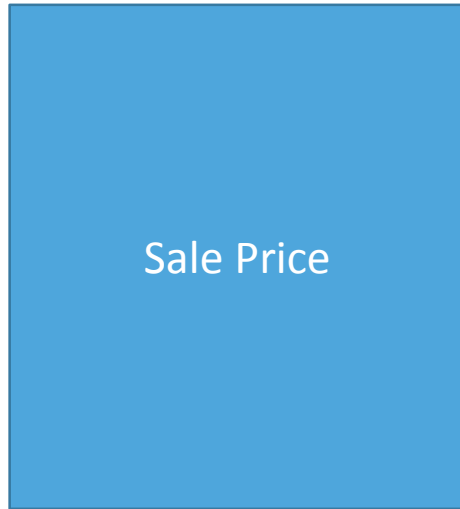
After a 20% discount 4 parts are left

20%
20%
20%
20%

This means 80% is left

And in reverse ...

The sale price represents 4 lots of 20%



Sale Price

The sale price must be divided by 4 to find the missing 20%

20%
20%
20%
20%
20%

Add this on to create 100%

Back to the problem

Trainers priced at £36 after a 20% discount, what was the original price?

The £36 sale price represents 4 lots of 20%

20%
20%
20%
20%

The sale price must be divided by 4 to find the missing 20%

£9.00
20%
20%
20%
20%

This creates 100% and shows that the original price is $5 \times £9 = £45$

Erm ... what about that £43.20?

Back to the problem again

Trainers priced at £36 after a 20% discount, what was the original price?

This is what
the sale price
actually
represents:

20%
20%
20%
20%

Now if you
find 20% of
the sale price:

£7.20
£7.20
£7.20
£7.20
£7.20

It's clear to
see that the
20% bars are
different
heights

That's craziness – how can 20% be two different amounts?

Hello ... £43.20?

Still not answered where that came from

So ...

Trainers priced at £36 after a 20% discount, what was the original price?

If you find
20% of the
sale price:

£7.20
£7.20
£7.20
£7.20
£7.20

+

£7.20

=

£7.20
£7.20
£7.20
£7.20
£7.20
£7.20

= **£43.20**

Add it on

**You've just calculated 120% of £36!
That wasn't the question!**

The Thinking Bit

- Always write down what you know
- Think about what it represents
- Don't just dive in with a calculator

- Original Amount – Discount = Sale price
- Eg: $100\% - 20\% = 80\%$

The Calculation Bit

- 15% of a juice drink has been drunk. There 212.5ml left. What was in the original drink?
- Original Amount – What was drunk = What is left
- $100\% - 15\% = 85\%$
- $212.5\text{ml} = 85\%$
- $1\% = 212.5\text{ml} \div 85 = 2.5\text{ml}$
- $100\% = 2.5\text{ml} \times 100 = 250\text{ml}$
- There was 250ml of juice originally



Over to you

A concert venue is sold out.

There are 6175 ticket holders inside the venue. Outside 35% of the ticket holders audience are waiting to get in.

- What is the capacity of the venue?



The Calculation Bit

- Venue Capacity – People inside = People outside
- $100\% - 65\% = 35\%$

- 6175 people = 65%
- $1\% = 6175 \div 65 = 95$
- $100\% = 95 \times 100 = 9500$
- The concert venue holds 9500 people

Reflection

- What notes could you write for yourself about reverse percentages?

Extension

- How could you develop this method for using decimal multipliers?