

## Reverse Percentages

### Starter

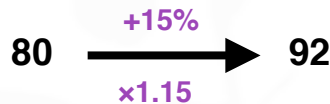
- (Review of last lesson)** Sarah earns £11.50 per hour. She then gets a 7% increase. What is her new pay per hour?
- John's pay is now paid £9.45/hour. This is after a 5% increase. What was his pay before the increase?

### Notes

So far we have looked at increasing a quantity by a percentage.  
How do we find the original price after an increase (or decrease) has taken place?

When £80 is increased by 15% it becomes £92.

In pairs, discuss what the diagram means in relation to "increasing 80 by 15% gives 92"



Here is what the diagrams and calculations would look like for the different types of question

#### Increase by a percentage



$$\begin{aligned} 80 \times 1.15 &= y \\ y &= 92 \end{aligned}$$

#### Reverse percentage



$$\begin{aligned} x \times 1.15 &= 92 \\ x &= \frac{92}{1.15} = 80 \end{aligned}$$

**E.g. 1** Draw a diagram and show the working as above that would find the answers to:

- The new price of a blouse is £65. This is after a 4% increase. What was the original price?
- Martha cycled 7% less today than yesterday. If today she cycled 39 km, how far did she cycle yesterday?

**Working:**



$$\begin{aligned} x \times 1.04 &= 64 \\ x &= \frac{64}{1.04} = \text{£}62.50 \end{aligned}$$

**E.g. 2** This year 16500 people visited a memorial site. This is a 20% increase on the previous year. How many visitors were there the previous year?

**E.g. 3** Find the original price of a painting sold for £1729 at a 5% loss.

**Recognising reverse percentage questions**

Reverse percentage questions use the past tense and ask what the price **was**.

Video: [Reverse percentages](#)

[Solutions to Starter and E.g.s](#)

**Exercise**

p165 Ex 9.7 Qu 1-10

**Summary**

Reverse percentage questions use the past tense and ask what the price **was**.

The unknown is on the left-hand side of the arrow

$$x \xrightarrow[\times 1.15]{+15\%} 92$$

When an amount,  $x$ , is increased by 15% it becomes £92.

[Textbook answers \(only available during a lockdown\)](#)