

Reverse Percentages

Starter

1. **(Review of last lesson)** Sarah earns £11.50 per hour. She then gets a 7% increase. What is her new pay per hour?

Working: $100\% + 7\% = 107\% \equiv 1.07$
 $11.50 \times 1.07 = £12.31$

2. John's pay is now paid £9.45/hour. This is after a 5% increase. What was his pay before the increase?

Working: **Either:** $100\% + 5\% = 105\% \equiv 1.05$
 Let x be John's pay before the increase.
 $1.05 \times x = 9.45$
 $x = 9.45 \div 1.05 = £9$

or: $105\% \equiv £9.45$ *use \equiv since a % cannot equal £*
 $1\% \equiv £0.09$ *$\div 105$ to find 1%*
 $100\% \equiv £9$ *$\times 100$ to find 100%*

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

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

Working: (a) $x \xrightarrow[\times 1.04]{+4\%} 65$

$$x \times 1.04 = 65$$

$$x = \frac{65}{1.04} = £62.50$$

(b) $x \xrightarrow[\times 0.93]{-7\%} 39$

$$x \times 0.93 = 39$$

$$x = \frac{39}{0.93} = 41.9 \text{ km}$$

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?

Working: $x \xrightarrow[\times 1.20]{+20\%} 16500$

$$x \times 1.20 = 16500$$

$$x = \frac{16500}{1.20} = 13750$$

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

Working: $x \xrightarrow[\times 0.95]{-5\%} 1729$

$$x \times 0.95 = 1729$$
$$x = \frac{1729}{0.95} = \text{£}1820$$

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

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