

# Percentages greater than 100 %

We use percentages that are greater than 100 % more often than you might think. It includes changing mixed number fractions to percentages, increasing an amount by a percentage, and compound interest questions.

## Check that you can:

- convert between fractions, decimals and percentages
- calculate the percentage of an amount with or without a calculator
- find equivalent fractions out of 100
- fully simplify fractions.

### Changing between fractions (mixed numbers), decimals and percentages (that are greater than 100 %)

Remember that 1 whole = 100 %, so  $\frac{1}{2} = 50\%$ ,  $\frac{1}{4} = 25\%$ ,  $\frac{1}{10} = 10\%$  and so on...

This means that  $1\frac{1}{2} = 150\%$ ,  $1\frac{1}{4} = 125\%$ ,  $1\frac{3}{4} = 175\%$ ,  $1\frac{1}{10} = 110\%$  and so on...

#### Percentage to Decimal

*Divide by 100.*

e.g.  $142\% = 1.42$

#### Percentage to Mixed Number

e.g.  $136\% = 1\frac{36}{100}$

This simplifies to  $1\frac{9}{25}$

#### Decimal to Percentage

*Multiply by 100.*

e.g.  $6.75 = 675\%$

#### Mixed Number to Percentage

e.g.  $3\frac{5}{8}$  is 3 whole and  $\frac{5}{8}$

3 whole is 300 %,  $\frac{5}{8}$  is 0.625 or 62.5 %

So,  $3\frac{5}{8}$  is 362.5 %

### Increasing an amount by a percentage

Increasing an amount by a percentage is equivalent to working with a percentage over 100 %.

For example,

Increase £300 by 12%.

*We need to calculate and add on 12%.*

£300 is 100 %

12 % of £300 is  $\frac{12}{100} \times £300 = £36$

$£300 + £36 = £336$

**The answer is £336.**

Alternatively:

$100\% + 12\% = 112\%$

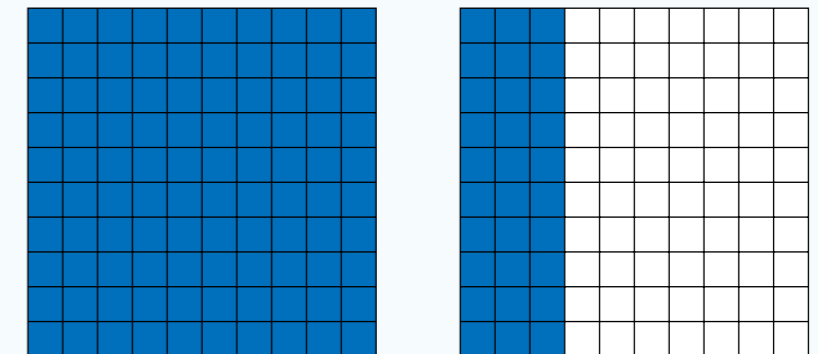
So, increasing £300 by 12 % is equivalent to finding 112 % of 300.

We can use the multiplier method for increasing by a percentage:

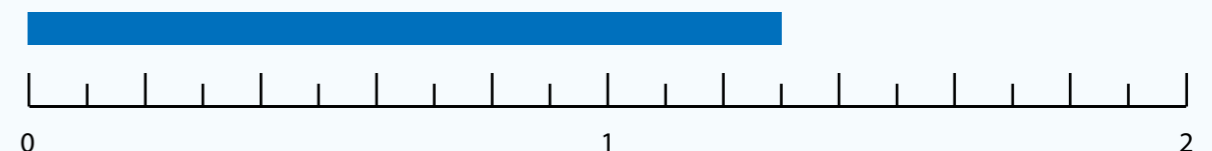
$£300 \times 1.12 = £336$

### Visualising percentages over 100 %

This diagram shows 130 %:



And so does this number line:



### Calculating the percentage of an amount (where the percentage is greater than 100%)

e.g. Without using a calculator, find 115 % of £480.

$115\% = 100\% + 10\% + 5\%$

100 % of £480 = £480

10 % of 480 = £48

5 % of 480 = £24

So 115% of £480 = £552

e.g. Using a calculator, calculate 157 % of £455.

$\frac{157}{100} \times 455 = £714.35$

### REMEMBER!

A percentage is a fraction with 100 as its denominator. This is the reason that we divide by 100 in 'percentage of amounts' questions.