

## *Model Answers:* Using Percentages

Using Percentages  
study guide



Percentages  
study guide



Multiplying Numbers  
study guide



Cancelling Down  
Fractions study guide



1. You should develop a good strategy to move between the different forms of a percentage. Some conversions are more difficult than others and sometimes you will need a calculator. However you should try to perform as many as the calculations without the use of a calculator when you are practising.

**Decimal to percentage:** To move from a decimal to a percentage you multiply the decimal number by 100 and include the percentage sign so:

$$0.325 = 0.325 \times 100\% = 32.5\%$$

**Percentage to decimal:** To move from a percentage to a decimal you divide the percentage by 100 so:

$$28.15\% = 28.15 \div 100 = 0.2815$$

**Percentage to fraction:** You need to divide the percentage by 100, this makes a fraction which has a denominator of 100 and a numerator of the percentage you are converting. If your percentage has decimal places you need to multiply the numerator and denominator by ten for every decimal place you have. This will remove any decimal places from the fraction. You can then cancel the fraction down if need be. For example:

$$32.5\% = \frac{32.5}{100} = \frac{32.5 \times 10}{100 \times 10} = \frac{325}{1000} \text{ and this fraction can then be cancelled down to } \frac{13}{40}.$$

**Fraction to decimal:** You can use a calculator to perform the division if you are not comfortable using a chunking method or long division.

By applying these methods you can fill the table in as follows.

Decimal	Percentage	Fraction (in simplest form)	In Words
0.325	32.5%	$\frac{325}{1000} = \frac{13}{40}$	Three hundred and twenty five out of one thousand or thirteen out of forty
0.2815	28.15%	$\frac{2815}{10000} = \frac{563}{1000}$	Two thousand eight hundred and fifteen out of ten thousand or five hundred and sixty three out of one thousand
0.18	18%	$\frac{18}{100} = \frac{9}{50}$	Eighteen out of one hundred or nine out of fifty
0.4375	43.75%	$\frac{7}{16}$	seven out of sixteen
0.025	2.5%	$\frac{50\,000}{2\,000\,000} = \frac{1}{40}$	50000 out of two million
0.85	85%	$\frac{68}{80} = \frac{17}{20}$	Seventeen out of twenty
0.0522	5.22%	$\frac{522}{10000} = \frac{261}{5000}$	Two hundred sixty one out of five hundred
3.3	330%	$\frac{330}{100} = \frac{33}{10}$	Three hundred and thirty out of hundred or thirty three out of ten

2.

- (i) **Percentage of ...** To find the required percentage of £840 you multiply 840 by the decimal equivalent of the percentage. For example:

$$32.5\% \text{ of } \pounds 840 \text{ is } (32.5 \div 100) \times 840 = 0.325 \times 840 = \pounds 273$$

- (ii) **Percentage decrease ...** To find the required percentage decrease of £840 you multiply 840 by one minus the decimal equivalent of the percentage. For example:

$$\pounds 840 \text{ decreased by } 32.5\% \text{ is } (1 - 0.325) \times 840 = \pounds 567$$

- (iii) **Percentage increase ...** To find the required percentage increase of £840 you multiply 840 by one plus the decimal equivalent of the percentage. For example:

$$\text{£840 increased by 32.5\% is } (1 + 0.325) \times 840 = \text{£1113}$$

- (iv) **The amount £840 in the percentage of ...** This question is asking what amount of money £840 is (for example) 32.5% of. To calculate this you divide £840 by the decimal equivalent of the percentage and round your answer to two decimal places. So:

$$\frac{840}{0.325} = \text{£2584.62} \text{ which tells you that £840 is 32.5\% of £2584.62}$$

Using these methods you can fill in the table as follows.

Percentage	(i)	(ii)	(iii)	(iv)
32.5	273	567	1113	2584.62
28.15	236.46	603.54	1076.46	2984.01
18	151.2	688.8	991.2	4666.67
43.75	367.5	472.5	1207.5	1920
2.5	21	819	861	33600
85	714	126	1554	988.24
5.22	43.85	796.15	883.85	16091.95
330	2772	-1932	3612	254.55



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