

Percentages (H)

A collection of 9-1 Maths GCSE Sample and Specimen questions from AQA, OCR, Pearson-Edexcel and WJEC Eduqas.

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Total Marks:	

1. (a) In an election, Stella gained 28 416 votes out of a total of 38 400 votes.

Write 28 416 as a percentage of 38 400.

$$\frac{28416}{38400} \times 100 = 74\%$$

[2]

(b) Jake needs to find a selling price which is 12% more than £766.

Find the selling price.

$$766 \times 1.12 = £857.92$$

[2]

2. Circle the calculation that increases 400 by 7% 1.07

400 x 0.07

400 x 0.7

400 x 1.07

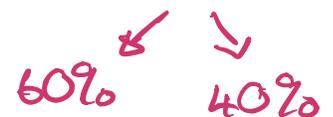
400 x 1.7

[1]

3. In a company, the ratio of the number of men to the number of women is 3:2

40% of the men are under the age of 25

10% of the women are under the age of 25



What percentage of all the people in the company are under the age of 25?

men
40% of 60%
10% = 6
6 + 18 = 24%

women
10% of 40% = 4%

Total = 24 + 4

.....28.....% [4]

4. In 1999 the minimum wage for adults was £3.60 per hour.

In 2013 it was £6.31 per hour.

$$6.31 - 3.60 = 2.71$$

Work out the percentage increase in the minimum wage.

$$\frac{2.71}{3.60} \times 100 = 75.277$$

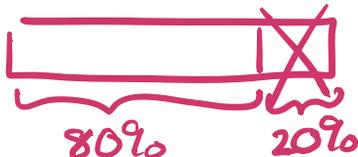
$$\frac{75.3}{(1dp)} \% [3]$$

5. A shop has a sale that offers 20% off all prices.

On the final day they reduce all sale prices by 25%.

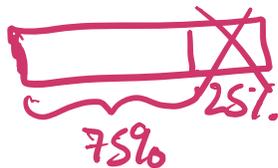
Alex buys a hairdryer on the final day.

Work out the overall percentage reduction on the price of the hairdryer.



$$0.75 \times 0.8 = 0.6 = 60\% \text{ left}$$

$$\text{so the reduction} = 40\%$$



$$\dots\dots\dots 40 \dots\dots\dots \% [6]$$

6. Kamile sells sandwiches.

In May, she sold 400 sandwiches.

In June, Kamile sold 20% more sandwiches than in May.

In July, Kamile sold 15% fewer sandwiches than in June.

Calculate the percentage change in her sales from May to July.

May

$$200$$

June

$$200 \times 1.2 = 240$$

July.

$$240 \times 0.85 = 204$$

$$\frac{4}{200} \times 100 =$$

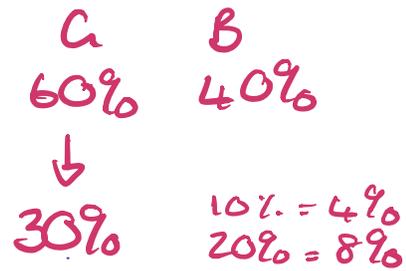
$$\dots\dots\dots 2 \dots\dots\dots \% [5]$$

7. In a school, 60% of the students are girls.

50% of the girls walk to school.

20% of the boys walk to school.

What percentage of the students walk to school?



$\% \text{ who walk} = 30\% + 8\% = 38\%$

[3]

8. A shop has a sale.

Microwave ovens

$\frac{1}{3}$ off normal price

£135

Combination ovens

40% off normal price

£140

A microwave oven has a sale price of £90

$\frac{1}{3}$ off $\frac{2}{3} = £90$ $\frac{1}{3} = £45$

A combination oven has a sale price of £84

$\frac{3}{8} = 45 \times 3 = 135$

Which of these ovens has the greater normal price?

You must show all your working.

combination oven

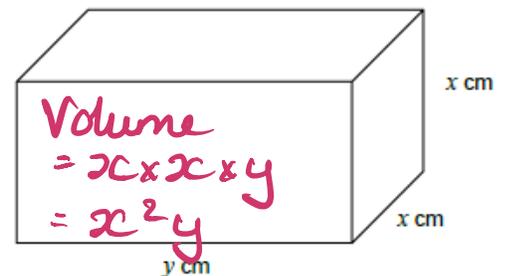
The combination has the greater price.

$£84 = 60\% \downarrow \div 6$
 $£14 = 10\%$
 $£140 = 100\% \times 10$

[4]

9. A cuboid has dimensions x cm, x cm and y cm

New Volume = $1.1x \times 1.1x \times 0.8y$
 $= 0.968x^2y$



x is increased by 10% 1.1
 y is decreased by 20% 0.8

$1 - 0.968 = 0.032$
 3.2%

Work out and describe the percentage change in the volume of the cuboid.

There is a reduction in volume of 3.2%

[4]

$$\boxed{100\%} + \boxed{30\%}$$

10. Sophie sells birthday cards.

She adds 30% profit to the cost price.

She sells the cards for £2.34 each.

She wants to increase her profit to 40% of the cost price.

How much should she sell each card for?

$$130\% = £2.34$$

$$\div 13 \quad 10\% = 0.18$$

$$100\% = £1.80 \quad \downarrow \times 100$$

$$£1.80 \times 1.40 = £2.52$$

[3]

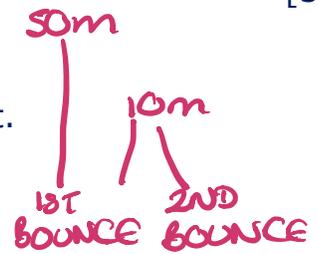
11. A ball is dropped from a height of 50 metres.

After each bounce, the ball reaches 20% of its previous height.

How high does it reach after the second bounce?

$$50 \times 0.2 = 10m$$

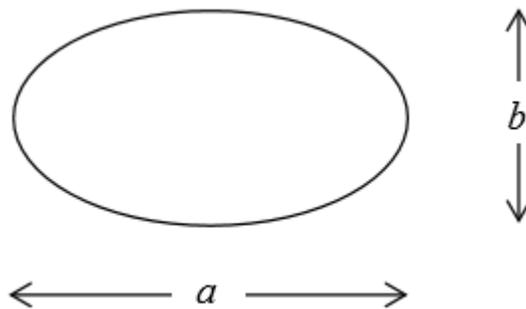
$$10 \times 0.2 = 2m$$



[2]

12. The area of an ellipse, width a and height b , is given by

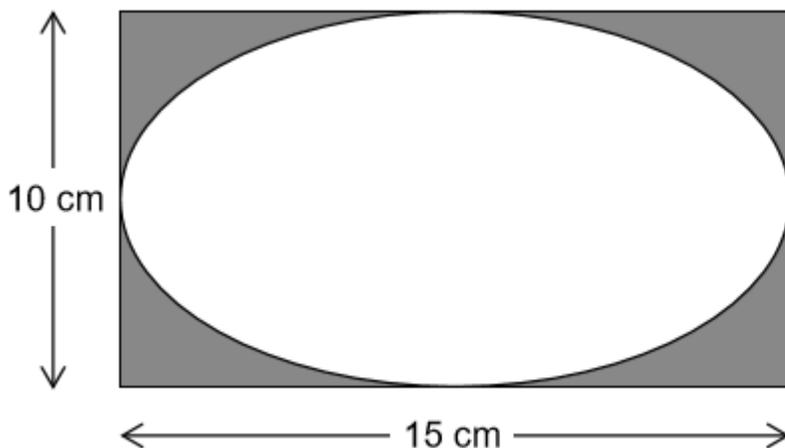
$$\frac{\pi ab}{4}$$



A rectangular photograph measures 15 cm by 10 cm

It is put into a frame as shown.

area of rectangle = $10 \times 15 = 150 \text{ cm}^2$



Not drawn accurately

Ellipse = $\frac{\pi \times 15 \times 10}{4} = 37.5\pi \text{ cm}^2$

The part of the photograph that can be seen is an ellipse.

Work out the percentage of the photograph that can be seen.

$\frac{37.5\pi}{150} \times 100 = 78.5398\dots$

78.5% (1dp)

[3]

13. A doctor claims that the probability of having regular illness is doubled if you have poor sleep rather than good sleep.

In a survey, 16% of people with poor sleep had regular illness.

Here are the results for people with good sleep.

Good Sleep

	Number of people
Regular illness	24
Not regular illness	276

300

Comment on the doctor's claim. You must show your working.

survey
poor sleep.
regular illness
16%

good sleep
regular illness
 $\frac{24}{300} \times 100 = 8\%$

[3]

$8\% \times 2 = 16\% \therefore$ the doctor's claim is correct.

CREDITS AND NOTES

Q	Awarding Body	Q	Awarding Body	Q	Awarding Body
1	WJEC Eduqas	6	OCR	11	AQA
2	AQA	7	AQA	12	AQA
3	Pearson Edexcel	8	Pearson Edexcel	13	AQA
4	AQA	9	AQA		
5	OCR	10	AQA		

Notes:

These questions have been retyped from the original sample/specimen assessment materials and whilst every effort has been made to ensure there are no errors, any that do appear are mine and not the exam board s (similarly any errors I have corrected from the originals are also my corrections and not theirs!).

Please also note that the layout in terms of fonts, answer lines and space given to each question does not reflect the actual papers to save space.

These questions have been collated by me as the basis for a GCSE working party set up by the GLOW maths hub - if you want to get involved please get in touch. The objective is to provide support to fellow teachers and to give you a flavour of how different topics "could" be examined. They should not be used to form a decision as to which board to use. There is no guarantee that a topic will or won't appear in the "live" papers from a specific exam board or that examination of a topic will be as shown in these questions.

Links:

AQA <http://www.aqa.org.uk/subjects/mathematics/gcse/mathematics-8300>

OCR <http://ocr.org.uk/gcsemaths>

Pearson Edexcel <http://qualifications.pearson.com/en/qualifications/edexcel-gcses/mathematics-2015.html>

WJEC Eduqas <http://www.eduqas.co.uk/qualifications/mathematics/gcse/>

Contents:

This version contains questions from:

AQA – Sample Assessment Material, Practice set 1 and Practice set 2

OCR – Sample Assessment Material and Practice set 1

Pearson Edexcel – Sample Assessment Material, Specimen set 1 and Specimen set 2

WJEC Eduqas – Sample Assessment Material

