Name ANSWERS	Class

MATHS TEACHER HUB

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Percentages

(9 – 1) Topic booklet

Higher

These questions have been collated from previous years GCSE Mathematics papers.

You must have: Ruler graduated in centimetres and millimetres, protractor, pair of compasses, pen, HB pencil, eraser.	Total Marks

Instructions

- Use **black** ink or ball-point pen.
- **Fill in the boxes** at the top of this page with your name, centre number and candidate number.
- Answer **all** questions.
- Answer the questions in the spaces provided
  – *there may be more space than you need.*
- Diagrams are NOT accurately drawn, unless otherwise indicated.
- You must **show all your working out.**
- If the question is a **1H** question you are not allowed to use a calculator.
- If the question is a **2H** or a **3H** question, you may use a calculator to help you answer.

Information

- The marks for **each** question are shown in brackets
  – *use this as a guide as to how much time to spend on each question.*

Advice

- Read each question carefully before you start to answer it.
- Keep an eye on the time.
- Try to answer every question.
- Check your answers if you have time at the end.

Answer ALL questions
Write your answers in the space provided.
You must write down all the stages in your working.

3 A delivery company has a total of 160 cars and vans.

the number of cars : the number of vans = 3 : 7

Each car and each van uses electricity or diesel or petrol.

$\frac{1}{8}$ of the cars use electricity.
25% of the cars use diesel.
The rest of the cars use petrol.

Work out the number of cars that use petrol.
You must show all your working.

$\frac{160}{10} = 16$

Cars : Vans
3 : 7
×16 ↳ 48 : 112

$\frac{1}{8}$ of 48 = 6 cars use electricity

25% of 48 = 12 cars use diesel

48 - 6 - 12 = 30 cars use petrol

30

(Total for Question 3 is 5 marks)

3 A bonus of £2100 is shared by 10 people who work for a company.
40% of the bonus is shared equally between 3 managers.
The rest of the bonus is shared equally between 7 salesmen.

One of the salesmen says,

"If the bonus is shared equally between all 10 people I will get 25% more money."

Is the salesman correct?
You must show how you get your answer.

2100 = 100%
210 = 10%
840 = 40%

840 ÷ 3 = £280 to each manager.

2100 - 840 = 1260

1260 ÷ 7 = £180 each salesman.

2100 ÷ 10 = 210 is shared equally

£180 + 25%

180 + 45 = £225

10% = 18
20% = 36
5% = 9
25% = 45

Salesman is incorrect
£210 < 225
so he would get less than 25% extra.

(Total for Question 3 is 5 marks)

3 Renee buys 5 kg of sweets to sell.
She pays £10 for the sweets.

5000g

Renee puts all the sweets into bags.
She puts 250 g of sweets into each bag.
She sells each bag of sweets for 65p.

Renee sells all the bags of sweets.

Work out her percentage profit.

$\frac{5000g}{250g} = 20$ bags

$20 \times 0{\cdot}65 = £13$

£10 → £13 = £3 profit

$\frac{3}{10} = 30\%$

30 %

(Total for Question 3 is 4 marks)

4 At the end of 2017

the value of Tamara's house was £220 000
the value of Rahim's house was £160 000

At the end of 2019

the value of Tamara's house had decreased by 20%
the value of Rahim's house had increased by 30%

At the end of 2019, whose house had the greater value?
You must show how you get your answer.

220000 = 100%
22000 = 10%
44000 = 20%

$$\begin{array}{r} 220000 \\ -\ 44000 \\ \hline £176000 \end{array}$$

160000 = 100%
16000 = 10%
48000 = 30%

$$\begin{array}{r} 160000 \\ +\ 48000 \\ \hline £208000 \\ {\scriptstyle 1} \end{array}$$

Rahims house value was greater at the end of 2019.

(Total for Question 4 is 4 marks)

5 Sean pays £10 for 24 chocolate bars.

He sells all 24 chocolate bars for 50p each.

Work out Sean's percentage profit.

$24 \times 0.50 = £12$

£10 → £12 = £2 profit

$\frac{2}{10} = 20\%$

20 %

November 2020 – Paper 1H **(Total for Question 5 is 3 marks)**

M:W

5 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 — 30 : 20

10% of the women are under the age of 25 — 60 : 40

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

40% of 60% = 24%

10% of 40% = 4%

28%

28 %

Sample 1 – Paper 1H **(Total for Question 5 is 4 marks)**

7 A shop has a sale.

Microwave ovens	Combination ovens
$\frac{1}{3}$ off normal price	40% off normal price

A microwave oven has a sale price of £90
A combination oven has a sale price of £84

Which of these ovens has the greater normal price?
You must show all your working.

$\frac{2}{3} = £90$

$\frac{1}{3} = £45$

$\frac{3}{3} = £135$ (Normal price)

$60\% = £84$

$10\% = £14$

$100\% = £140$ (Normal price)

The combination oven has the greater normal price.

(Total for Question 7 is 4 marks)

7 The price of a holiday increases by 20%
This 20% increase adds £240 to the price of the holiday.

Work out the price of the holiday before the increase.

£240 = 20%

£120 = 10%

£1200 = 100%

£ 1200

(Total for Question 7 is 2 marks)

8 The normal price of a mattress is reduced by 40% in a sale.
The price of the mattress in the sale is £660

Work out the normal price of the mattress.

$\frac{660}{0.6} = \frac{6600}{6} = 1100$

£ 1100

November 2023 – Paper 1H

(Total for Question 8 is 2 marks)

9 In a sale, the normal price of a coat is reduced by R%

Given that

sale price = 0.7 × normal price

find the value of R.

$R =$ 30

May 2024 – Paper 1H

(Total for Question 9 is 1 mark)

11 Jack and Sadia work for a company that sells boxes of breakfast cereal.

The company wants to have a special offer.

Here is Jack's idea for the special offer.

> Put 25% more cereal into each box and do **not** change the price.

Here is Sadia's idea.

> Reduce the price and do **not** change the amount of cereal in each box.

Sadia wants her idea to give the same value for money as Jack's idea.

By what percentage does she need to reduce the price?

100% + 25% = 125%

125% of cereal for the same price

You get 25% for 20% of the price

100% for 80% of the price

∴ 20% reduction

20 ..... %

(Total for Question 11 is 3 marks)