Edexcel GCSE

Mathematics

Foundation/Higher Tier

Number: Percentages

Information for students

The marks for individual questions and the parts of questions are shown in round brackets: e.g. **(2)**.
There are 50 questions in this selection.

Advice for students

Show all stages in any calculations.
Work steadily through the paper. Do not spend too long on one question.
If you cannot answer a question, leave it and attempt the next one.
Return at the end to those you have left out.

Information for teachers

The questions in this document are taken from the 2009 GCSE Exam Wizard and include questions from examinations set between January 2003 and June 2009 from specifications 1387, 1388, 2540, 2544, 1380 and 2381.

Questions are those tagged as assessing "Percentages" though they might assess other areas of the specification as well. Questions are those tagged as "Foundation/Higher" so could have (though not necessarily) appeared on either a Foundation, Intermediate or Higher tier paper.

GCSE Mathematics

Formulae: Foundation Tier

You must not write on this formulae page.

Anything you write on this formulae page will gain NO credit.

Area of trapezium $= (a + b)h$
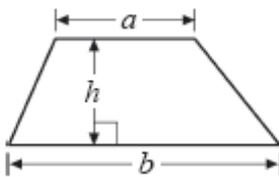
Volume of prism = area of cross section × length
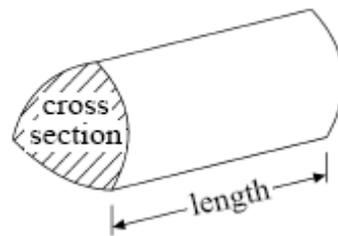
1. In 2002, Shorebridge Chess Club's total income came from a council grant and members' fees.

Council grant   £50
Members' fees   240 at £5 each.

(a)   (i)   Work out the total income of the club for the year 2002.

£ ....

(ii)   Find the council grant as a fraction of the club's total income for the year 2002.
Give your answer in its simplest form.

....

(3)

In 2001, the club's total income was £1000.
The club spent 60% of its total income on a hall.
It spent a further £250 on prizes.

(b)   Work out the ratio

The amount spent on the hall : the amount spent on prizes.

Give your answer in its simplest form.

....
(3)
(Total 6 marks)

2. Ben bought a car for £12 000.
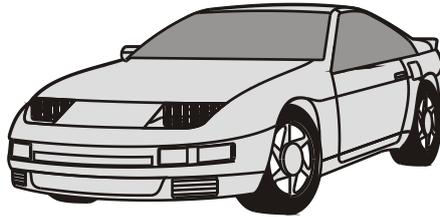
Each year the value of the car depreciated by 10%.

Work out the value of the car two years after he bought it.

£ ………………….

(Total 3 marks)

3.   Wayne bought an engagement ring for Tracy.
The total cost of the ring was £420 **plus** VAT at $17\frac{1}{2}$ %.

(a)   Work out the cost of the ring.

£ …………………………

(2)

Wayne invited 96 people to an engagement party.
Only 60 of the people invited came to the party.

(b)   Express 60 as a percentage of 96.

………………………… %

(2)
(Total 4 marks)

4.   The scatter graph shows information about 12 countries.

     For each country, it shows the percentage of the population in farming jobs and the percentage of the population living in towns.
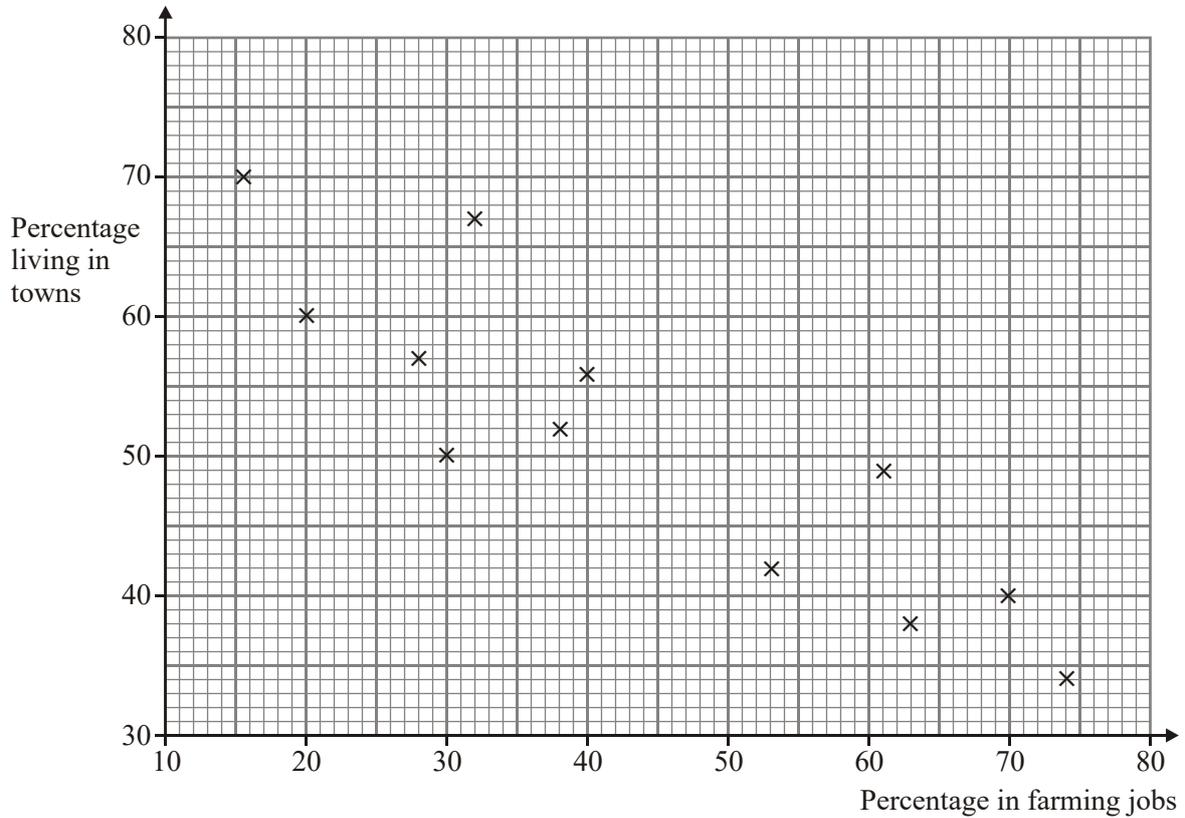
     (a)   Describe the relationship between the percentage of the population in farming jobs and the percentage of the population living in towns.

           …………………………………………………………………………………………………

           …………………………………………………………………………………………………

                                                                                                                   (1)

     (b)   Draw the line of best fit on the scatter graph.

                                                                                                                   (1)

In Mathsland, the percentage of the population in farming jobs is 35%.

(c)   Use your line of best fit to estimate the percentage of Mathsland's population living in towns.

……………………. %

(1)
(Total 3 marks)

5.   Martin had to buy some cleaning materials.

The cost of the cleaning materials was £64.00 plus VAT at $17\frac{1}{2}$%.

Work out the total cost of the cleaning materials.

£ ....

(Total 2 marks)

6.

	Number of girls	Number of boys
Year 10	108	132
Year 11	90	110

The table gives information about Year 10 and Year 11 at Mathstown School.

(a)   Work out the percentage of students in Year 10 who are girls.

.... %

(2)

Mathstown School had an end of term party.
40% of the students in Year 10 and 70% of the students in Year 11 went to the party.

(b)   Work out the percentage of all students in Years 10 and 11 who went to the party.

.... %

(3)
(Total 5 marks)

7.

	Number of girls	Number of boys
Year 10	108	132
Year 11	90	110

The table gives information about Year 10 and Year 11 at Mathstown School.

Mathstown School had an end of term party.
40% of the students in Year 10 and 70% of the students in Year 11 went to the party.

Work out the percentage of all students in Years 10 and 11 who went to the party.

.... %
(Total 3 marks)

**8.** The diagram shows a wall with a door in it.
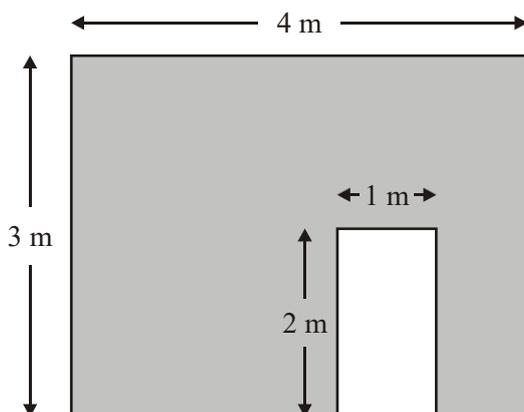
Diagram **NOT**
accurately drawn

(a)   Work out the shaded area.

…………………….m^2

(3)

Meg can cover the shaded area with 680 tiles.

She buys extra tiles in case she breaks some.

To work out the total number of tiles to buy, Meg increases 680 by 10%.

(b)   (i)   Increase 680 by 10%.

……………………..

The tiles Meg is going to use are sold in boxes of 50.

(ii)   Work out the number of boxes of tiles Meg should buy.

……………………..

(5)

(Total 8 marks)

9. Alistair sells books.

He sells each book for £7.60 plus VAT at $17\frac{1}{2}$ %.

He sells 1650 books.
Work out how much money Alistair receives.

£…………………….
(Total 4 marks)

10. Three woman earned a total of £36

They shared the £36 in the ratio 7:3:2

Donna received the largest amount.

(a) Work out the amount Donna received.

£…………………..
(3)

A year ago, Donna weighed 51.5 kg.

Donna now weighs $8\frac{1}{2}$% less.

(b)   Work out how much Donna now weighs.
       Give your answer to an appropriate degree of accuracy.

…………………kg

(4)
(Total 7 marks)

11.   The cost of a compact disc holder is 25p.
       John has £15 to spend.

(a)   What is the greatest number of compact disc holders that John can buy for £15?

....

(3)

A compact disc player costs £50 plus 17½% VAT.

(b)   Calculate the total cost of the compact disc player.

Compact disc player
£50 + VAT

£ ....
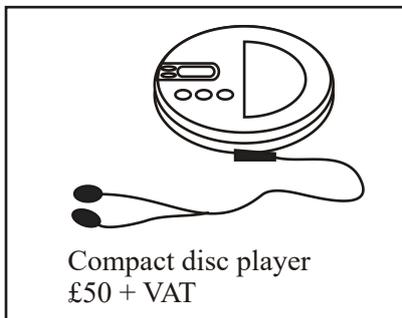
(3)
(Total 6 marks)

12.   Jenny worked in a bookshop for two weeks.

She is paid £125 per week **plus** 10% of the total value of the books she sells that week.

In the first week, she sold books with a total value of £800.

(a)   Work out the total amount she was paid in the first week.

£ ....

(3)

In the second week, Jenny was paid a total of £225

(b)   Work out the total value of the books she sold in the second week.

£ ....
                                                                                (3)
                                                                        (Total 6 marks)

13.   A doctor has 12 000 patients.

4560 of these patients are male.

(a)   What percentage of these patients are **female**?

.... %
                                                                                (3)

Here is the age, in years, of each of the first twenty patients the doctor saw yesterday.

| 5 | 20 | 13 | 19 | 27 | 32 | 39 | 26 | 39 | 45 |

| 56 | 47 | 59 | 52 | 28 | 21 | 10 | 36 | 7 | 27 |

(b)   In the space below, draw a stem and leaf diagram to show these ages.

(3)
(Total 6 marks)

14.   Ron went to Spain.

He changed pounds (£) into Euros (€). The exchange rate was £1 = €1.40

The value of the pound has decreased from €1.40 to €1.33

Calculate the percentage decrease in the value of the pound.

………………………%
(Total 3 marks)

15. Mr Brown buys a garden spade.
     The spade costs £20 plus 17½% VAT.

Garden spade

£20 + 17½ % VAT

(a) Calculate the total cost of the spade.

£ ....

(3)

Mr Brown makes some compost.
He mixes soil, manure and leaf mould in the ratio 3:1:1

Mr Brown makes 75 litres of compost.

(b) How many litres of soil does he use?

.... litres

(3)

Mr Brown sows 200 flower seeds.

For each flower seed the probability that it will produce a flower is 0.8

(c)   Work out an estimate for the number of these flower seeds that will produce a flower.

....

(2)
(Total 8 marks)

16.   The price of all rail season tickets to London increased by 4%.

(a)   Before this increase, the price of a rail season ticket from Reading to London was £2664
Work out the price after the increase.

£ ....

(3)

(b)   The price of a rail season ticket from Cambridge to London increased by £121.60
Work out the price before this increase.

£ ....

(2)

(c)   After the increase, the price of a rail season ticket from Brighton to London was £2828.80
Work out the price before this increase.

£ ....

(3)
(Total 8 marks)

17.   A concert ticket costs £45 plus a booking charge of 15%.

Work out the total cost of a concert ticket.

£ ....

(Total 3 marks)

18.   (a)   Use your calculator to work out $\dfrac{4.7}{9.4 - 3.5}$

Write down all the figures on your calculator display.

....

(2)

(b)   Write these numbers in order of size.
Start with the smallest number.

$$0.82 \qquad \frac{4}{5} \qquad 85\% \qquad \frac{2}{3} \qquad \frac{7}{8}$$

....

(2)
(Total 4 marks)

19.   James invested £2000 for three years in an Internet Savings Account.
He is paid 5.5% per annum **compound** interest.

Work out the **total interest** earned after three years.

£ ....
(Total 3 marks)

20. A hotel has 56 guests.
35 of the guests are male.

   (a) Work out 35 out of 56 as a percentage.

.... %

(2)

40% of the 35 male guests wear glasses.

   (b) Write the number of male guests who wear glasses as a fraction of the 56 guests.
   Give your answer in its simplest form.

....

(4)
(Total 6 marks)

21. Calculate 36% of £4500

£ ………………...
(Total 2 marks)

22. Plain tiles cost 28p each.
Patterned tiles cost £9.51 each.

Julie buys 450 plain tiles and 15 patterned tiles.

   (a) Work out the total cost of the tiles.

£ ………………...
(3)

(b)   Express 15 as a fraction of 450
        Give your answer in its simplest form.

………………...

(2)

Fred lays the tiles.
He charges £360 plus VAT at 17.5%.

(c)   Work out the total amount that Fred charges.

£ ………………...

(3)
(Total 8marks)

23.   In April 2004, the population of the European Community was 376 million.

In April 2005, the population of the European Community was 451 million.

(a)   Work out the percentage increase in population.

Give your answer correct to 1 decimal place.

...................................%

(3)

In April 2004, the area of the European Community was 3.2 million km^2.

In April 2005, the area of the European Community increased by $\dfrac{3}{8}$

(b)   Work out the area of the European Community in April 2005.

.... million km^2

(2)
(Total 5 marks)

24.   In April 2004, the population of the European Community was 376 million.

In April 2005, the population of the European Community was 451 million.

Work out the percentage increase in population.
Give your answer correct to 1 decimal place.

..................................%
(Total 3 marks)

25.   On July 1st 2004, Jack invested £2000 at 5% per annum compound interest.

Work out the value of Jack's investment on July 1st 2006

£ ....
(Total 3 marks)

26.   A coin is made from copper and nickel.
84% of its weight is copper.
16% of its weight is nickel.

Find the ratio of the weight of copper to the weight of nickel.
Give your ratio in its simplest form.

....
(Total 2 marks)

27.   A garage sells British cars and foreign cars.
The ratio of the number of British cars sold to the number of foreign cars sold is 2 : 7

The garage sells 45 cars in one week.

(a)   Work out the number of British cars the garage sold that week.

....
(2)

A car tyre costs £80 plus VAT at $17\frac{1}{2}$ %.

(b)   Work out the total cost of the tyre.

£ ....
                                                                    (3)
                                                            (Total 5 marks)

28.   A garage sells British cars and foreign cars.
The ratio of the number of British cars sold to the number of foreign cars sold is 2 : 7

The garage sells 45 cars in one week.

(a)   Work out the number of British cars the garage sold that week.

....
                                                                    (2)

A car tyre costs £80 plus VAT at $17\frac{1}{2}$%.

(b)   Work out the total cost of the tyre.

£ ....

(3)

The value of a new car is £12 000
The value of the car depreciates by 20% per year.

(c)   Work out the value of the car after 2 years.

£ ....

(3)
(Total 8 marks)

29.   A shop sells mobile phones.
       The table shows the number of mobile phones sold each month from January to May.

Jan	Feb	Mar	Apr	May
70	64	73	85	91

(a)   Work out the percentage increase in the number of mobile phones sold from April to
        May.
        Give your answer correct to 3 significant figures.

                                                                    .... %

                                                                                        (3)

(b)   Work out the 3-month moving averages for the information in the table.
        The first one has been worked out for you.

                                        ......69..... ....

                                                                                        (2)
                                                                          (Total 5 marks)

30. A tin of cat food costs 40p.
        A shop has a special offer on the cat food.

        ┌────────────────────────────┐
        │   **Special offer**   │
        │   │
        │ Pay for 2 tins and get 1 tin free │
        │   │
        │   [40p]   [40p]   [Free]   │
        │   │
        └────────────────────────────┘
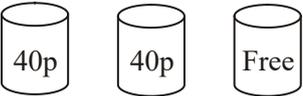
        Julie wants 12 tins of cat food.

(a)   Work out how much she pays.

£ ....

(3)

9 of the 12 tins are tuna.

(b)   Write 9 out of 12 as a percentage.

.... %

(2)

The normal price of a cat basket is £20
In a sale, the price of the cat basket is reduced by 15%.

(c)   Work out the sale price of the cat basket.

£ ....

(3)
(Total 8 marks)

31.   A tin of cat food costs 40p.
A shop has a special offer on the cat food.

Special offer

Pay for 2 tins and get 1 tin free

| 40p | | 40p | | Free |

Julie wants 12 tins of cat food.

(a)   Work out how much she pays.

£ ....

(3)

The normal price of a cat basket is £20
In a sale, the price of the cat basket is reduced by 15%.

(b)   Work out the sale price of the cat basket.

£ ....

(3)
(Total 6 marks)

32. The cost of a radio is the list price plus VAT at $17\frac{1}{2}\%$.

The list price of a radio is £240

Work out the cost of the radio.

£ ....

(Total 3 marks)

33. Jack invests £3000 for 2 years at 4% per annum compound interest.

Work out the value of the investment at the end of 2 years.

£ ....

(Total 3 marks)

34.   A can of drink costs 32p.
The cost of the can of drink is increased to 38p.

Jenny calculates that this is a percentage increase of 19%.

Is Jenny's percentage correct?
You must show how you reached your decision.

(Total 3 marks)

35.   Work out the **simple** interest on £530 at 4.5% per annum after 3 years.

£ …………………………
(Total 3 marks)

36. Work out 23% of £64

£ ....
(Total 2 marks)

37. Find the **simple** interest on £3500 invested for 3 years at 4% per year.

£ …………………..
(Total 3 marks)

38.

Jacob answered 80% of the questions in a test correctly.
He answered 32 of the questions correctly.

Work out the total number of questions in the test.

…………………..
(Total 3 marks)

39.   The normal cost of a coat is £94
In a sale the cost of the coat is reduced by 36%

Work out 36% of £94

£ …………………..
(Total 2 marks)

40.   Ann buys a dress in a sale.
The normal price of the dress is reduced by 20%.
The normal price is £36.80

Work out the sale price of the dress.

£ ....
(Total 3 marks)

41.   The price of a DVD player was £120
         In a sale, the price is reduced by 35%.

         Work out the sale price of the DVD player.

£ ....
(Total 3 marks)

42.   (a)   Linda gets 24 out of 40 in a science test.

                Write 24 out of 40 as a percentage.

......................................%
(2)

         (b)   Work out $\dfrac{2}{3} + \dfrac{1}{5}$

....
(2)
(Total 4 marks)

43.   Lewis wants to buy a new pair of trainers.

There are 3 shops that sell the trainers he wants.

Sports '4' All	Edexcel Sports	Keef's Sports
Trainers	**Trainers**	**Trainers**
£5	$\frac{1}{5}$ off	**£50**
plus	usual price of	plus
10 payments of £4.50	**£65**	VAT at $17^1/_2\%$

(a)   Work out the cost of a pair of the trainers in Sports '4' All.

£…………………….

(2)

(b)   Work out the cost of a pair of the trainers in Edexcel Sports.

£…………………….

(2)

(Total 4 marks)

44.   A jacket costs £50 plus VAT at $17^1/_2\%$.

Work out the total cost of the jacket.

£…………………….

(Total 2 marks)

45.   Ahmed is planning a holiday.

The holiday costs £450
Ahmed pays a deposit of 30% of the cost of the holiday.

Work out how much deposit Ahmed pays.

£ ....
(Total 2 marks)

46.   Andrew got 42 out of 50 marks in a history test.
He got 48 out of 60 marks in a geography test.

The marks for each test were changed to a percentage.

In which test did Andrew get the higher percentage mark?
You must show all your calculations.

....
(Total 4 marks)

47.   The table shows the number of mobile phones sold in a shop in April and in May.

April	May
85	91

Work out the percentage increase in the number of mobile phones sold from April to May.
Give your answer correct to 3 significant figures.

.... %
(Total 3 marks)

48.   Find 15% of £200

£ ....
(Total 1 mark)

49.   Work out 35% of 240

....
                                                    (Total 2 marks)

50.   Mary scored 14 out of 20 in a test.

Find 14 out of 20 as a percentage.

.... %
                                                    (Total 2 marks)

01.   (a)   (i)   1250   3

240 × 5 = 1200

  B1 cao 1250

(ii) $\dfrac{1}{25}$

$\dfrac{50}{'1250'}$

M1 cao $\dfrac{50}{'1250'}$

A1 for $\dfrac{1}{25}$ *in its simplest form*

(b)   12:5   3

$$\frac{60}{100} \times 1000 = 600$$

M1 for $\frac{60}{100} \times 1000$ oe

A1 for 600

A1 cao

[6]

02.   9720   3

$$\frac{10}{100} \times 12000 = 1200$$

12 000 − 1200 = 10 800

10 800 ÷ 10 = 1080

10 800 − 1080 = £9720

M1 for $\frac{10}{100} \times 12\ 000$ or sight of 1200 or 2400 or 10 800 or 9600

M1 (dep) for $\frac{10}{100} \times (12\ 000 - \frac{10}{100} \times 12\ 000)$ or sight of 1080

A1 cao

Alternative markscheme

M2 for $12000 \times \left(1 - \frac{10}{100}\right)^2$

(M1 for $12000 \times \left(1 - \frac{10}{100}\right)$)

A1 cao

[3]

03.   (a)   £493.50   2

$$\frac{17.5}{100} \times 420 = £73.50 \textbf{ or } 1.175 \times 420$$

£73.50 + £420 =

M1 for $\frac{17.5}{100} \times 420$ o.e. or 1.175 × 420 or £73.50

Or for part working: 42, 21, 10.5

A1 cao

(b)   62.5%   2

$\dfrac{60}{96} \times 100$

M1 for $\dfrac{60}{96} \times 100$ oe

A1 cao

[4]

04.   (a)   Negative **or** as urban goes up, farming goes down   1
             B1 cao oe

(b)   Line within tolerance.   1
             B1 for line within overlay lines, at least 10cm in length

(c)   35° farming   1
             B1 ft ±½ dep on single straight line with negative gradient

[3]

05.   75.20   2

$1.175 \times £64$ or $\dfrac{17.5}{100} \times 64$ or £11.20 seen

*M1 1.175 × 64, 0.175 × 64 oe or 11.20 or 75.2 seen or 6.40,
3.20 and 1.60 seen*
A1 cao

[2]

06.   (a)   45%   2

$$\frac{108}{240}$$

M1 for $\frac{108}{240}$

A1 cao

SC: B1 for 55% if M0

(b)   53.6%   3

$4 \times 240 + ..7 \times 200 = 96 + 140$

$\frac{236}{440} \times 100$

M1 for either 0.4 × 240 or 0.7 × 200 or 96 or 140 seen

A1 (dep) for 0.4 × 240 +0.7 × 200, (96 + 140) or 236 seen

A1 53 – 54%

[5]

07.   53.6%   3

$4 \times 240 + 7 \times 200 = 96 + 140$

$\frac{236}{440} \times 100$

M1 for either 0.4 × 240 or 0.7 × 200 or 96 or 140 seen

A1 (dep) for 0.4 × 240 + 0.7 × 200, (96 + 140) or 236 seen

A1 53 – 54%

[3]

08. (a)   10   3

$4 \times 3 - 2 \times 1$

$12 - 2$

> *M1 for 3 × 4 (= 12) or 1 × 2 or attempt to divide diagram up into rectangles*
> *M1 "12" – "2" or sum of areas of rectangles*
> *A1 cao*

(b)   (i)   748   5

$\dfrac{10}{100} \times 680$ or $680 \div 10$

$680 + 68$

> *M1 $\dfrac{10}{100}$ × 68 or 680 ÷ 10 or 68 seen*
> *M1 (dep) 680 + "68" or M2 for 680 × 1.10*
> *A1 cao*

(ii)   15

"748" ÷ 50 or 14.96

> *M1 For "748" ÷ 50 or 14.96*
> *Accept "748" rounded up or down to next 50 followed by ÷ 50*
> *A1 ft from (b)(i) rounded up*
> *SC B1 for 680 (seen) leading to 14*

[8]

09.   £14 734.50   4

$7.60 \times \dfrac{17.5}{100} = 1.33$

$7.60 + 1.33 = 8.93$

$1650 \times \text{"}8.93\text{"}$

> *M1 for $7.60 \times \dfrac{17.5}{100}$ or 1.33 seen or 7.60×1.175 (oe)*
>
> *(Award M1 for 10%, 5% and 2½% correctly calculated)*
>
> *A1 for 8.93 or 893*
>
> *M1 for 1650 x "8.93" or digits 147345 seen*
>
> *A1 cao Accept 14734.5*
>
> ***Alternative***
>
> *M1 for $1650 \times 7.6(0)$ or 12540 seen*
>
> *M1 for "12540" $\times \dfrac{17.5}{100}$ or 2194.5 seen or "12540" $\times 1.175$*
>
> *(oe)*
>
> *(Award M1 for 10%, 5% and 2½% correctly calculated)*
>
> *M1 for "12540" + "2194.5" (dep on both previous method marks) or digits 147345 seen*
>
> *A1 cao accept 14 734.5*

[4]

10.   (a)   21   3

$36 \div (7 + 3 + 2)$

$\text{"}3\text{"} \times 7$

> *M1 for $36 \div (7 + 3 + 2)$*
>
> *M1 (dep) for "3" $\times$ 7 or 3 or 2*
>
> *A1 cao*

(b)   47 or 47.1 or 47.12   4

$$51.5 \times \frac{8.5}{100} = 4.3775$$

$51.5 - 4.3775 = 47.1225$

M1 for $51.5 \times \dfrac{8.5}{100}$ or 4.37(75) seen

M1 (dep) for 51.5 – "4.37(75)"

A1 for 47 or better

B1 (indep) for rounding their answer correctly to the nearest whole number or 1 or 2 d.p

OR

M1 for $51.5 \times \dfrac{100 - 8.5}{100}$

M1 for 51.5 × "0.915" or 0.515 × "91.5"

A1 for 47 or better

B1 (indep) for rounding their answer correct to the nearest whole number or 1 or 2 d.p

[7]

11. (a)   £1 ÷ 25p = 100 ÷ 25 = 4
            15 × 4 = 60   3

M1 Conversion of £ to p eg × 100 or 1500
M1 (indep) 15 ÷ 25, 100 ÷ 25 = 4 (or 4 as a digit seen)
A1 cao

(b)   eg 10%+5%+2.5%= £5 + £2.50 + £1.25
            So VAT = £8.75
            Total cost is £50 + £8.75
            = £58.75   3

M1 5, 2.5(0), 1.25 or 17.5 ÷ 2, 50×17.5÷100 oe
M1 "£8.75" + £50 where the "£8.75"has been derived
from a percentage calculation
OR M2 for 50 × 1.175 oe
A1 cao

[6]

12. (a)   £800 × 10/100 = £80
            £80 + £125 = 205   3
M1 for 800 × 10/100 oe
M1 (dep) for "80" + 125
A1 cao

(b)   £225 – £125 = £100
       £100 is 10% of value of items
       Value of items is £100 × 100 ÷ 10
       = £1000   3
                    M1 for 225 – 125
                    M1 for recognising that "100" is equivalent to 10%
                    A1 cao

                                                                         [6]

13.   (a)   100 × 4560/12000 = 38%
              = 62%   3
                    M1 for 100 × 4560/12000 (=38) or 12000–4560(=7440)
                    M1 for 100–"38" or 100 × "7440"/12000
                    A1 cao

       (b)   Ages   3

              0 | 5 7

              1 | 0 3 9

              2 | 0 1 6 7 7 8

              3 | 2 6 9 9

              4 | 5 7

              5 | 2 6 9

              Key 5 | 2 = 52 (yrs)
                    B1 for stem as 0, 1, 2, 3, 4, 5 or 0, 10, 20, 30, 40, 50

                    *B1 for accurate unordered (or ordered) leaves
                    condone 1 error or omission*

                    B1 for key and ordered leaves all correct

                                                                         [6]

14.   1.40 – 1.33 = 0.07
       "0.07" ÷ 1.40 × 100
       5%   3
                    M1 for 1.40 – 1.33 or 0.07
                    M1 (dep) for "0.07" ÷ 1.40 × 100
                    A1 cao
                    Or

                    M1 for $\dfrac{1.33}{1.40} \times 100$

                    M1(dep) for 100 – "95"
                    A1 cao

                                                                         [3]

15. (a)   eg 10% + 5% + 2.5% = £2 + £1 + £0.50   3
£20 + £3.50 = 23.50

> *M1 for £2, £1 and £0.50 or £3.50 seen or $\frac{17.5}{100}$ × 20 oe*
>
> *M1 (dep) for "£3.50"+ £20*
> *A1 for 23.5(0)*

(b)   75 ÷ (3 + 1 + 1) = 15   3
15 × 3 = 45

> *M1 for 75 ÷ (3 + 1 + 1)*
> *M1 (dep) for "15" × 3*
> *A1 cao*

(c)   0.8 × 200 = 160   2

> *M1 for 0.8 × 200*
> *A1 for 160, accept 160 out of 200*
>
> *SC: B1 for $\frac{160}{200}$ or 160 in 200*

[8]

16. (a) $\frac{4}{100}$ × 2664   3
= 2770.56

> *M1 for $\frac{4}{100}$ × 2664 (= 106.56)*
> *M1 (dep) for "106.56" + 2664*
> *A1 for 2770.56*

(b)   121.6(0) × $\frac{100}{4}$ 2
= 3040

> *M1 for 121.6(0) × $\frac{100}{4}$ oe*
>
> *A1 cao*

(c) 1.04 oe seen   3
2828.8 ÷ 1.04
= 2720

B1 for 1.04 oe seen accept 104%
M1 for 2828.8 ÷ 1.04 oe
A1 for 2720

[8]

17. $45.00 + 45.00 \times \dfrac{15}{100} =$

$45.00 + 6.75 = 51.75$ 3

M2 for $45.00 + 45.00 \times \dfrac{15}{100}$ oe

*or 45.00 × 1.15 oe or 45.00 + 6.75 or complete method
or 5175 seen.*

(M1 for $45.00 \times$ oe $\dfrac{15}{100}$ or 6.75 seen or 675 seen

or correct method for calculating 15% of 45)
A1 cao
SC Award B2 for an answer of 38.25

[3]

18. (a) 4.7 ÷ 5.9 = 0.796610169
= 0.7966..   2

B2 for 0.7966 or better

(B1 for 0.8, 0.80, 0.79, 0.796, 0.797 or digits 59 seen)

(b) 0.82, 0.8, 0.85, 0.66, 0.875
0.66, 0.8, 0.82, 0.85, 0.875
2/3, 4/5, 0.82, 85%, 7/8
2/3, 4/5, 0.82, 85%, 7/8   2

B2 correct order (oe decimals in order)

*(B1 correct order reversed, or one error in ordered listing) with
or without decimal equivalents.*

NB Accept 0.67 or 0.66

[4]

19. $2000 \times (1.055)^3$
Interest = 2348.48 – 2000
= 348.48   3

> *M1 for 5.5/100 × 2000 (oe) or 330 or16.5/100 × 2000*
> *or 2330 or 110 or 2110*
> *M1 (dep) for 5.5/100 × (2000 + "110" + "116.05") or 122.4…*
> *seen*
> *A1 cao (accept only 348.48 or 348.49)*
>
> *or*
>
> *M2 for $2000 \times (1.055)^3$ or 2348.48(…) or 2348.49 seen*
> *(M1 for $2000 \times (1.055)^n$, $n \neq 3$)*
> *A1 for 348.48 or 348.49*
> *[SC: B2 for 2348.48 – 2348.49]*

                                                      [3]

20.   (a) $35/56 \times 100$ 2

                   = 62.5

> *M1 for 35/56 × 100*
> *A1 for 62.5oe*

     (b) $40/100 \times 35 = 14$
                = 14/56 1/4   4

> *M1 for 40/100 × 35*
> *A1 for 14*
>
> *M1 ft for "14"/56 oe*
> *A1 cao for ¼*

                                                        [6]

21. $\dfrac{36}{100} \times 4500 = 1620$ 2

> *M1* $\dfrac{36}{100} \times 4500$
>
> *A1 cao*

                                                        [2]

22.   (a) $450 \times 28 = 12600p = £126$
              $15 \times 9.51 = £142.65$
              $£142.65 + £126$
              $= 268.65$ 3

> *M1 for 450 × 28 or 0.28x450 or digits 126 seen*
>
> *M1 for 15 × 9.51 or 951 × 15 or digits14265 seen*
>
> *A1 cao*

   (b) $\dfrac{15}{450} = \dfrac{1}{30}$

         $\dfrac{1}{30}$ 2

> *M1 for* $\dfrac{15}{450}$
>
> *A1 for* $\dfrac{1}{30}$
>
> *SC B1 for 0.03(……..) or 3.33(……..)%*

   (c) 360×1.175 or
         $360 \times \dfrac{17.5}{100} = 63$

         $360 + 63$

         $= £423$ 3

> *M2 for 360 × 1.175 oe*
>
> *A1 cao*
>
> *or*
>
> *M1 for 360 ×* $\dfrac{17.5}{100}$ *(= 63)*
>
> *or attempt at 10%, +5%, +2.5% eg digits 36 + 18 + 9*
>
> *M1 (dep) 350 + "63"*
>
> *A1 cao*

                                                                          [8]

23.   (a) $\dfrac{451-376}{376}\times 100$ 3

 = 19.9%

$M1 \quad \dfrac{451-376}{376}=\dfrac{75}{376}=0.199$

$M1 \; (dep) \quad \dfrac{'451-376'}{376}\times 100$

A1 19.9 – 19.95%

Alternative:

$M2 \quad \dfrac{451}{376}\times 100\;-\;100$

A1 19.9 – 19.95%

SC: B1 for 119.9 – 119.95 or $\dfrac{'451-376'}{451}\times 100$ *oe*

(b) $3.2 \div 8 \times 3 = 1.2$

 = 4.4   2

NB: ignore 0s for the purpose of awarding the method marks.

M1 digits 32 with either ÷8 or ×3 or 4 seen or 1.2 seen or digits 96 seen

A1 cao

[5]

24. $\dfrac{451-376}{376} \times 100 = 19.9\%$ 3

$M1 \ \dfrac{451-376}{376} = \dfrac{75}{376} = 0.199$

$M1 \ (dep) \ \dfrac{'451-376'}{376} \times 100$

A1 19.9 – 19.95%

Alternative:

$M2 \ \dfrac{451}{376} \times 100 - 100$

A1 19.9 – 19.95%

SC: B1 for 119.9 – 119.95 or $\dfrac{451-376}{451} \times 100 \ oe$

NB: ignore 0s for the purpose of awarding the method marks.

                                                                                        [3]

25. $2000 \times 1.05^2 = 2000 \times 1.1025$

or

$2000 \times 1.05 = 2100$

$2100 \times 1.05 = 2205$

= £2205   3

M2 2000 × 1.05²

(M1 2000 × 1.05, n ≠ 2)

A1 cao

or

$M1 \ \dfrac{5}{100} \times 2000 \ (oe) \ or \ 100 \ or \ 200 \ or \ 2100 \ or \ 2200 \ seen$

$M1 \ (dep) \ \dfrac{5}{100} \times (2000 + \text{"}100\text{"})$

A1 cao

SC B2 for £2315.25 seen (3 yrs)

                                                                                        [3]

26.   84:16 or 42:8
          21:4   2

> *M1 84:16 or 42:8 or 4:21 or 5.25:1 or 1:0.19…, or any*
> *multiple of 84:16 (eg 8.4:1.6, 21:4, 10.5:2), or for answers*
> *given the wrong way around.*
> *For M1 ignore % signs.*
> *A1 cao*

                                                                                                [2]

27.   (a) $45 \times 2 \div 9$
                 10   2

> *M1 for 45×2 or $45 \div$ "2 + 7" or 5 seen, or 90 seen, or 10 seen*
> *as part of a ratio (eg 10:35)*
> *A1 cao*

        (b) $(80 \times 17.5/100) + 80 = 14 + 80 =$
                 £94   3

> *M2 for or $80 \times \dfrac{117.5}{100}$ or 80×1.175 oe*
>
> *A1 cao*
> *or*
> *M1 for 80×0.175 or $80 \times \dfrac{17.5}{100}$ oe or 14 seen or 8 + 4 + 2*
>
> *seen*
> *M1(dep) '14' + 80 or $80 + (80 \times 0.175)$ oe*
> *A1 cao*

                                                                                                [5]

28.   (a) $45 \times 2 \div 9$
                 10   2

> *M1 for $45 \div$ "2 + 7" or 45×2 or 5 seen, or 90 seen or 10 seen*
> *as part of a ratio e.g 10:35*
> *A1 cao*

     (b) $(80 \times 17.5/100) + 80 = 14 + 80 = £94$ 3

          M2 for or $80 \times \dfrac{117.5}{100}$ or 80×1.175 oe

          A1 cao
          or
          M1 for 80×0.175 or $80 \times \dfrac{17.5}{100}$ oe or 14 seen or $8 + 4 + 2$
          seen
          M1(dep) '14' + 80 or $80 + 80 \times \dfrac{17.5}{100}$ oe
          A1 cao

     (c) 12000×0.8^2

          M2 for 12000×0.8^2 or 12000×0.8^3
          A1 cao

     OR

     1st yr: $12000 \times 0.2 = 2400$; $12000 - 2400 = 9600$
     2nd yr: $9600 \times 0.2 = 1920$; $9600 - 1920 = 7680$
     [3rd year is £6144; 4th yr is £4915.20]
     £7680   3
          M1 12000×0.8 oe or 9600 or 2400 or 4800 or 7200 seen
          M1(dep) '9600' $\times 0.8$ oe
          A1 cao
          (if correct answer seen, ignore extra years)

                                                    [8]

29.   (a) $\dfrac{91-85}{85} \times 100 = \dfrac{6}{85} \times 100 = 7.05882..$
      7.06%   3

          M2 $\dfrac{91-85}{85} \times 100$

          (M1 $\dfrac{91-85}{85}$ or sight of $\dfrac{6}{85}$ or $0.0705 - 0.071$ or $\dfrac{91}{85}$ or
          $1.0705 - 1.071$)
          A1 $7.05 - 7.06$
          Or
          M1 $\dfrac{91}{85} \times 100$ (= 107.05)
          M1 (dep) "107.05" – 100
          A1 7.05-7.06
          T&I methods must lead to an answer 7.05 –7.06 for full marks,
          otherwise 0 marks

(b)   (64 + 73 + 85)/3 = 222/3 = 74
(73 + 85 + 91)/3 = 249/3 = 83
74, 83   2

> *M1 for (64 + 73 + 85)/3 or (73 + 85 + 91)/3 or 222/3 or 249/3*
> *or 74 or 83 (condone missing brackets)*
> *A1 both answers in the correct order cao*

[5]

30.   (a)   12 ÷ 3 × 2 (=8)
8 × 40
Alternative:
3 tins = 40 × 2 = 80
12 tins = 80 × 4
3.20   3

> *M2 for 40 × 12 ÷ 3 × 2 or better (inc. adding 8 lots of 40p)*
> *(M1 for using 2 of the 3 operations or 8 seen)*
> *A1 cao*
> *OR*
> *M1 for 3 tins = 40 × 2 (=80)*
> *M1 for "80" × 4*
> *A1 cao*
> *[SC: if M0 scored: B2 for digits 32, or B1 for 480 or 4.80]*

(b) $\dfrac{9}{12} \times 100$
75   2

> *M1 for $\dfrac{9}{12}$ oe*
> *A1 cao*

(c) $\dfrac{15}{100} \times 20 = 3$

OR   10% = 20 ÷ 10 = 2
        5% = 2 ÷ 2 = 1
        15% = 2 + 1 = 3

20 – 3
Alternative:
20 × 0.85

17   3

M1 for $\dfrac{15}{100}$ *× 20 oe or a correct method to work out 10% and*

5% of 20, or 2 and 1 seen
A1 for 3 cao
A1 ft for 20 – "3" dependent on M1 scored
Alternative:
B1 cao for 85 or 0.85 seen
M1 for $\dfrac{"100-15"}{100}$ *× 20 or "1 – 0.15" × 20*

A1 ft for a correct solution of $\dfrac{"100-15"}{100}$ *× 20 or "1 – 0.15" ×*

20 or 17 dependent on M1 scored
SC (for both alternatives) B2 for £3

[8]

31.   (a)   12 ÷ 3 × 2 (= 8)
            8 × 40

<u>Alternative</u>
3 tins = 40 × 2 = 80
12 tins = 80 × 4

3.20   3

M2 for 40 × 12 ÷ 3 × 2 or better (inc. adding 8 lots of 40p)
(M1 for using 2 of the 3 operations or 8 seen)
A1 cao
OR
M1 for 3 tins = 40 × 2
M1 (dep) for "80" × 4
A1 cao
[SC: B2 for sight of digits 320 if M0 scored]
[SC: B1 for 480 or 4.80 if M0 scored]

(b)　　$\dfrac{15}{100} \times 20 = 3$

OR 10% = 20 ÷ 10 = 2

5% = 2 ÷ 2 = 1

15% = 2 + 1 = 3

20 − 3

<u>Alternative</u>

20 × 0.85

17　　　　　　　　　　　　　　　　　　　　　　　　　　　　　　　　　3

$M1$ for $\dfrac{15}{100} \times 20$ *oe or a correct method to work out 10% and*

5% of 20 or 2 and 1 seen

A1 for 3 cao

A1 ft for 20 − "3" dependant upon M1 scored

[SC: B2 for 3 on answer line with no working]

<u>*Alternative*</u>

B1 cao for 85 or 0.85 seen

M1 for $\dfrac{"100-15"}{100}$ *or "1 − 0.15" × 20*

A1 ft for a correct solution of $\dfrac{"100-15"}{100}$ *or "1 − 0.15" × 20*

OR 17 (dep on M1 scored)

[6]

32.　　$240 \times \dfrac{117.5}{100}$

or

240 + 24 + 12 + 6

£282　　　　　　　　　　　　　　　　　　　　　　　　　　　　　3

B1 for 117.5 or 1.175

M1 for 240 × $\dfrac{117.5}{100}$ *oe*

A1 cao

OR

M1 for 240 × $\dfrac{17.5}{100}$ ***OR** 24 + 12 + 6 oe **OR** 42*

*M1(dep) for 240 + "42" **OR** 240 + 24 + 12 + 6*

A1 cao

[3]

33. $3000 \times \dfrac{4}{100} + 3000 = 3120$

$3120 \times \dfrac{4}{100} + 3120 = 3244.80$

or $3000 \times \left(\dfrac{104}{100}\right)^2$

3244.80   3

> *M1 for $3000 \times \dfrac{4}{100}$ or 120 or 240 or 3240 or 3120 or 1.04 ×*
>
> *3000 or 2880 or 2760*
>
> *M1(dep) for $(3000 + '120') \times \dfrac{4}{100}$ or 124.8(0) or "3120" ×*
>
> *1.04*
> *A1 £3244.8(0)*
> ***OR***
>
> *M2 $3000 \times \left(\dfrac{104}{100}\right)^2$ or $3000 \times \left(\dfrac{104}{100}\right)^2$*
>
> *A1 £3244.8(0)*
> *NB : If correct answer seen then ignore subsequent years*

[3]

34. 18.75 ≠ 19 not justified
6.08 ≠ 6 not justified   3

$\dfrac{6}{32} \times 100 = 18.75\%$ ***OR*** $\left(\dfrac{19}{100} \times 32 = 6.08\,p\right)$

> *M1 for $\dfrac{6}{32} \times 100$ **OR** M1 for $\dfrac{19}{100} \times 32$*

6.08 ≠ 6 not justified

> *A1 for 18.75 **OR** A1 for 6.08*
> *B1 (dep on M1) for comparison with 19%*
> ***OR** B1 (dep on M1) for comparison with 6%*

[3]

35.   71.55   3

$\text{SI} = 530 \times 4.5 \times \dfrac{3}{100}$

>   *M1 for $530 \times \dfrac{4.5}{100}$*
>   *M1 for "23.85" × 3 (dependent on an attempt to find 4.5% of 530)*
>   *A1 cao*

[3]

36.   14.72   2

>   *M1 for $\dfrac{23}{100} \times 64$ oe*
>   *A1 cao*

[2]

37.   420   3

$3500 \times 3 \times \dfrac{4}{100}$

>   *M1 $\dfrac{4}{100} \times 3500$ (or 140)*
>   *M1 (dep) "$\dfrac{4}{100} \times 3500$" × 3*
>   *A1*
>   *[SC: B2 for 3920 only]*

[3]

38.   40   3

$\dfrac{100}{80} \times 32$

>   *M1 for $\dfrac{80}{100} \times \dfrac{32}{x}$ 32 oe*
>   *M1 for $\dfrac{100}{80} \times 32$ oe*
>   *A1*

[3]

39.   £33.84   2

$$\frac{36}{100} \times 94$$

M1 for $\frac{36}{100} \times 94$

A1 cao

(£60 – 16 alone scores M1 A0)

                                                                            [2]

40.   £29.44   3

$20 \div 100 \times 36.80 \ (= 7.36)$

$36.80 – \text{"}7.36\text{"}$

<u>Alternative</u>

$$\frac{80}{100} \times 36.80$$

M1 for $20 \div 100 \times 36.80$ oe

A1 for 7.36

B1 ft for the correct answer to 36.80 – "7.36" (dep on M1 scored)

M2 for $\frac{80}{100} \times 36.80$

A1 cao

[SC: B2 for £44.16]

                                                                            [3]

41. $120 \times \dfrac{35}{100} = 42$

$120 - 42$

Alternative

$100 - 35 = 65$

$\dfrac{65}{100} \times 20$

78   3

        M1 for $120 \times \dfrac{35}{100}$ oe or for 42 seen 100

        M1 (dep) for $120 - $ "42"

        A1 cao

        <u>*OR*</u>

        M1 for $100 - 35$ or 65 seen

        M1 (dep) for $\dfrac{"65"}{100} \times 120$

        A1 cao

                                                                          [3]

42. (a) $\dfrac{24}{40} \times 100$

      60%   2

        M1 for $\dfrac{24}{40} \times 100$ oe

        A1 cao

    (b) $\dfrac{10}{15} + \dfrac{3}{15}$

      $\dfrac{13}{15}$ oe or 0.86(7)   2

        M1 for converting to fractions with a common denominator
        with at least one correct numerator or 0.66(7) + 0.2 (both
        decimals correct)

        A1 for $\dfrac{13}{15}$ oe or 0.86(7)

                                                                          [4]

43. (a) $5 + 10 \times 4.50$

      50   2

        M1 for 10×4.50 or 45 seen
        A1 for 50

(b) $65 - \dfrac{65}{5}$

52

2

M1 for 65 ÷ 5 oe, or 13 seen
A1 for 52

[4]

44. $50 + \dfrac{17.5}{100} \times 50$

58.75

2

M1 for $\dfrac{17.5}{100}$ 50 oe or 1.175 × 50 or 5, 2.5(0) and 1.25
seen or 8.75 seen or digits 5875 seen
A1 for 58.75

[2]

45. $\dfrac{30}{100} \times 450$

135

2

M1 for $\dfrac{30}{100} \times 450$ oe
***or** any correct build up method, ignoring arithmetical errors oe*
A1 for 135
(SC: B1 for an answer of 315 or 585)

[2]

46.   42 out of 50 = 84 %
       48 out of 60 = 80 %

history + calculations   4

> *M1 for correct method of making one mark a percentage, decimal*
> *A1 for 84 % or 80 % or 0.84 or 0.8 oe*
> *M1 for correct method of making **both** marks into percentages or decimals e.g. 84 % and 80 % or 0.84 and 0.80 o.e.*
> *A1 (dep on M2 A1 and both percentages or decimals correct) for history (accept 42 out of 50 or 42/50 or 84% or 0.84 oe)*
>
> ***Alternative method 1 (equivalent fractions)***
> *M1 for correct method to identify a denominator that is the same for history and geography*
> *A1 for writing one of the marks as a correct fraction of their denominator*
> *M1 for correct method of making both marks into fractions with the same denominator*
> *A1 (dep on M2 A1 and both equivalent fractions correct) for history (accept 42 out of 50 or 42/50)*
>
> ***Alternative method 2 (complement method)***
> *M1 for identifying both 8 and 12 as marks **not** gained*
> *A1 for 16% or 20% or 0.16 or 0.20 oe*
> *M1 for correct method of making **both** marks into percentages or decimals e.g. 16% and 80% and 0.16 and 0.2*
> *A1 (dep on M2 A1 and both percentages or decimals) for history (accept 42 out of 50 or 42/50 16%)*

[4]

47. $\dfrac{91-85}{85} \times 100 = \dfrac{6}{85} \times 100 =$

7.05882..

7.06   3

M2 for $\dfrac{91-85}{85} \times 100$ or $\dfrac{6}{85} \times 100$

(M1 for $\dfrac{91-85}{85}$ or sight of $\dfrac{6}{85}$ or 0.0705 – 0.071 or $\dfrac{91}{85}$ or

1.0705 – 1.071 oe)

A1 7.05 – 7.06

OR

M1 for $\dfrac{91}{85} \times 100$ (= 107.05...)

M1 for "107.05" – 100

A1 7.05 – 7.06

Trial and Improvement methods must lead to an answer 7.05 – 7.06 for full marks, otherwise 0 marks

[3]

48. $\dfrac{15}{100} \times 200$ or 20 + 10

30   1

B1 cao

[1]

49. $\dfrac{35}{100} \times 240 = 84$ 2

M1 for $\dfrac{35}{100} \times 240$ or 0.35 × 240 or 35 × 2.4 or 24 + 24 + 24

+12 or for any complete method.

A1 for 84 cao

[2]

50. $\dfrac{\dfrac{14}{20} \times 100}{70}$

2

M1 for $\dfrac{14}{20} \times 100$ or $\dfrac{1400}{20}$ or 14 × 5 seen or $\dfrac{70}{100}$ or $\dfrac{7}{10}$ OR for
a correct method to turn fraction into percentage
OR for a correct decomposition,
e.g. 10 + 2 + 2 = 50% + 10% + 10% (condone one error)
A1 cao

[2]

01.   Paper 2

About 90% of candidates worked out the income of the club in (a) (i) correctly. However, few went on to write down the correct fraction for (a) (ii).
In part (b) a significant proportion of answers or working shown indicated the successful calculation of 60% of £1000 for which 2 marks were awarded, yet only a small minority (less than 5%) were able to give the correctly and fully simplified ratio '12:5'.

Paper 4

The total income was found correctly by most candidates in part (i) of (a), but part (ii) was very poorly attempted. Many wrote $\dfrac{50}{1200}$ or $\dfrac{1250}{50}$, leading to an incorrect answer. Finding the amount spent on the hall in (b) proved straightforward for most candidates but many were then unable to give the ratio in its simplest form. A ratio of 6:2.5 was seen often and some gave an answer in unitary form.

02.   Mathematics A

Paper 3

A significant number of candidates merely assumed this could be calculated using simple interest methods. Whilst many knew that they had to calculate 10% of 12000, and even wrote this out as $12000 \times \dfrac{10}{100}$, it was disappointing how many such calculations resulted in an answer of £120. When both of these errors occurred, no credit was earned. Some credit could have been earned if candidates demonstrated, by their working out, that a compound, rather than simple interest method was being used. More able candidates had little difficulty in obtaining the correct answer.

Paper 5

On this non-calculator paper most candidates successfully considered each year separately rather than using the multiplication factor $(0.9)^2$. Weaker candidates frequently obtained the wrong answer £9600 by assuming that the depreciation was £1200 in each year. Although careless subtractions resulted in the loss of the accuracy mark it is pleasing to report that, in general, candidates showed sufficient working to enable the examiners to award the method marks.

Mathematics B Paper 16

It is most encouraging to note that only a small number of candidates do not know the meaning of the word "depreciation".
The majority of candidates were able to work out 10% of £12000 correctly, the greater proportion then went on to subtract 2 × £1200 from the original cost to give an answer of £9600. Of those candidates who understood the problem many showed an alarming inability to continue the arithmetic accurately, 12000 – 1200 = 11200 or 11800 was often seen.

03.   Candidates who divided by 17.5 gained no marks; it is surprising how many candidates attempt a division to find a percentage. Many candidates attempted a non-calculator method to find 10%, 5% and 2.5%, before adding this on, but for many the arithmetical demands of this process resulted in failure. This is an inappropriate method for a non-calculator paper. A significant number calculated the VAT, but failed to add it on. In part (b) many candidates were tempted to round their answer to 63%. Some misunderstood the question and found 60% of 96. As for the previous part, too many candidates attempted non-calculator methods here, breaking the process down into various stages, unsuccessfully.

04.   A surprising number of candidates found difficulty in finding the relationship, preferring to describe a single point, or making speculative statements about people living in towns and on farms. Nearly all candidates drew a single straight line (of negative gradient) as a line of best fit, and then went on to use this to accurately read off a value.

05.   This question was rarely correct, the most common wrong answer being 81.50 (64 + 17.50). Answers such as £75.02 with no working could receive no credit, even though the digits suggested that a correct method could have been used.

06. In this question candidates had to assimilate the information provided in the table, extract relevant information and process it in terms of percentage calculations. In part (a) weaker candidates either chose the wrong figures to use, or did not know how to write one number as a percentage of another. Overall this part was well answered, with 50% of candidates gaining full marks. Part (b) required a greater degree of sophistication, and far fewer candidates had any real success as a result. Some were able to find that 236 students went to the party, but were then confused as to what they had to do with this figure. Many tried to combine percentages at too early a stage, or added 40 and 70 to get 110%. There were many disappointing trial and improvement techniques again, with answers greater than 100% not uncommon. This question discriminated well, and demonstrated significant weaknesses of candidates in applying percentages to real life contexts.

07. In this question, candidates had to extract information from a table and manipulate it to a percentage. There were several steps to carry out, finding two percentages of and then converting a fraction to a percentage. Many candidates were able to do this comfortably. A surprising minority of candidates made the addition error of $108 + 132 = 140$ and ended up with an upper school population of 340. A few candidates took the mean of 40 and 70.

08. **Specification A**

Foundation Tier

In part (a), confusion between area and perimeter was very much in evidence. Unfortunately, the correct answer could be obtained by adding the dimensions shown on the diagram. If an answer of 10 had clearly been obtained in this way, then no credit was given. Many candidates gained just one mark for the product 3×4 or 12. Only a minority went on to find the product 2×1, sometimes evaluated as 3, and subtract it from 12.
Few candidates were able to calculate 10% of 680 in part (b)(i), 690 (680 + 10) appearing regularly. However, many salvaged 2 marks in part (b)(ii) by correctly finding the number of boxes needed for the number of tiles in their answer to part (i). Some used division by 50 but repeated addition of 50 was a more common approach.

Intermediate Tier

This question provided an opportunity for candidates of all abilities to show what they could do, and many gained full marks. In part (a) the most common (and frustrating) error was $1 \times 2 = 3$. Weaker candidates tried to calculate the perimeter. Most chose a method of subtracting two areas, but those who tried dividing up the shaded area into a series of rectangles then had problems in identifying the correct dimensions of their chosen rectangles. In part (b) a significant minority calculated 10% of 680, rather than increasing the 680 by 10%. Many of the candidates then failed to understand the final part of this question, reverting back to the 680 to work out the number of boxes, rather than using their increased value. Nearly all were able to correctly divide by 50, or manage a system of counting up (or down) using 50s. Indeed, it was encouraging to find that most candidates demonstrated sound understanding of arithmetical (non-calculator) techniques in solving the various parts of this question.

Specification B

It was good to see that candidates were able to score marks on the last question on the paper, often with much working shown.

(a) At least a third of the candidates scored 1 or more marks by showing a recognition of area either by dividing the shape into more manageable areas or by writing a starting point of 4 × 3 or 2 × 1 but many confused area and perimeter with 14 (the perimeter of the large rectangle) being a popular incorrect answer.

(b) Many tried to add 10 onto 680 reaching 690 but were then able to divide this correctly by 50 scoring 2 marks in part (ii). In fact, over 35% of the candidates were able to correctly divide their answer to (b)(i) correctly and then round it up to score the final 2 marks on the paper.

09. **Specification A**

Foundation Tier

Finding 17½% of a quantity seemed beyond all but the best candidates, even when the use of a calculator was allowed. Only 5% of candidates gained full marks. There was little evidence of the use of scale factors 1.175 or 0.175 – even from successful candidates. Candidates preferred to work out 10%, 5%, 2½% and add their answers. Many incorrect attempts were seen – for example division by 17.5 or the addition of 17.5 in attempts to add on VAT. Many candidates (27%) were able to salvage one mark by showing that they understood the need to multiply the price of one book by 1650.

Intermediate Tier

This question was generally well answered, with many candidates showing a full method and finding the correct answer, and the majority of candidates were able to gain at least one mark. Unfortunately, though, some candidates gave an incorrect answer with no method. The order of evaluation varied – some calculated the VAT for one book and added it on to find the total cost of one book, others found the cost of 1650 books and then calculated the VAT. A significant number of candidates used build-up methods (e.g. 10% + 5% + 2.5%) to calculate the VAT and these attempts often went wrong. Arithmetic errors were common, suggesting that some candidates did not use a calculator. The VAT was sometimes given as 43p (£7.60 ÷ 17.5).

Specification B

This proved to be a challenging final question in which only a minority were able to work through to attain the correct answer. It was necessary to break the problem down into stages and to attempt each stage in turn. Calculating 17.5%of £7.60 or 1650 × £7.60 was usually the accepted starting point but beyond this there was only limited success. Of the two main methods of approach, as outlined in the mark scheme, there was a tendency to merge the two as the solution progressed which meant that they were unable to distinguish between their results and continue to reach a conclusion. Just 5% gained the full four marks although 40% were able to access one mark. The 'chunking' method of finding 17½ % by finding 10%, 5% and 2½ % rarely ended in a numerically correct result.

10. **Specification A**

    Higher Tier

    Part (a) rarely posed a challenge at this level. Most candidates were also successful on part (b) either by working out 8.5% and subtracting the kg or by working out 91.5% of the initial weight. Generally candidates were able to round off answers to a sensible degree of accuracy. Of those that got it wrong the main faulty approach was to split the 8.5% into parts (5%, 2.5% etc). In this case accuracy was often lost and/or numbers entered in the wrong columns.

    Intermediate Tier

    Part (a) was answered very well and candidates who understood the concept of ratio generally gained full marks. Part marks were rarely awarded. The most common error was for candidates to work out $36 \div 7$, $36 \div 3$ and $36 \div 2$ and then give an answer of £18, the largest amount. Responses to part (b) were mixed. Whilst many candidates (just over 40%) gained full marks there were many poor attempts as well. Build-up methods to find 8½% were common and these often resulted in an incorrect answer. Many candidates did use a calculator to correctly work out 8½% of 51.5 as 4.3775 but some then truncated this to 4.37 or 4.3 before subtracting and others who obtained an answer of 47.1225 did not round it to an appropriate degree of accuracy at the end. Marks were often lost through a lack of understanding of 'percentage'. Quite a few candidates divided 51.5 by 8.5 and subtracted the answer from 51.5 and some merely subtracted 8.5 from 51.5.

    Specification B

    Dividing £36 in the given ratio was usually accurately done in part (a), often showing more work than required in answering the question, by giving the correct answers for all three shares. The most common error here was to divide £36 by 7, 3 and 2 and then select the highest value. In part (b) methods for finding 8.5% of 51.5 kg were varied. Success was usually achieved where candidates multiplied 51.5 by $\frac{8.5}{100}$. Build up methods were very common but usually failed due to arithmetic error, and through no explicit explanation of the method being given. For example; 10% = 5.15 followed by 5% = 0.515 must be explained (ie 5% = 5.15 ÷ 2 = 0.515) if method marks are to be awarded when arithmetic errors are made. Answers given to an appropriate degree of accuracy were common with whole number, one and two decimal places being acceptable. It was not uncommon to see 51.5 ÷ 8.5 in an attempt to find the percentage. Many weaker candidates simply subtracted 8.5 from 51.5 to give 43; this gained no marks.

11. This question proved to be a good discriminator. In part (a) those candidates who worked out that 4 CD holders cost £1 often went on to score full marks, the exception being those who lost the accuracy mark for an error in multiplying the 4 & 15. Others attempting to divide by 25 had more difficulty. In part (b) many candidates were able to find 1*0%,* 5% of £50 correctly, but many then went on to present either an incorrect or incomplete method, perhaps even just finding 1% and *½%,* and not the required *2½%,* which seems strange. Those who tried to work out 50 × 17.5 ÷ 100 often made errors in calculation. A significant number failed to attempt to add their VAT back onto the £50. The weakest candidates merely added 17.5 onto 50.

12. This question was answered well. The majority of candidates gained full marks for part (a) and almost 70% were successful in part (b). Some candidates gave the answer to part (b) as £100 or assumed that £225 was 10% of the total value.

13. In part (a) most candidates identified that 7440 patients were female but many then had little idea how to write this as a percentage of 12000. 7440 ÷ 100 = 74.4% was a common incorrect response. Candidates who wrote a correct fraction were usually successful but those who started with 12000 = 100%, 6000 = 50%, etc. rarely gained any more marks. About 50% of candidates gained at least two of the three marks in part (b), but relatively few provided a key and some left the leaves unordered. Surprisingly, a significant number of candidates did not appear to be familiar with stem and leaf diagrams. Frequency tables and drawings of stems and leaves were frequently seen and some candidates made no attempt at all.

14. This question was answered less well. It was pleasing that some candidates reasoned that 10% = 0.14 and therefore 5% = 0.07. A few worked out that 1.33 is 95% of 1.40 but did not then subtract this from 100%. A very common incorrect answer was 7% as many candidates simply subtracted 1.33 from 1.40 and then multiplied the result by 100.

15. About half of the candidates calculated the total cost correctly in part (a). Those who were successful in finding 17½% of £20 had usually calculated 10%, 5% and 2½%. Those who tried to use 1% and ½% often made errors. Some failed to add on the VAT. A similar proportion of candidates answered part (b) correctly. A common error was to divide 75 by 3. Some who did divide by 5 then forgot to multiply by 3 and gave 15 as the final answer. In part (c), 50% of candidates appreciated the need to multiply 0.8 by 200 but many could not complete the calculation correctly.

16. Part (a) was answered well by most candidates. Weaker candidates calculated the increase, or demonstrated how, without progressing to the final stage. A significant number attempted non-calculator methods of finding the 4%, usually working through 10%, 5%, and then not knowing how to proceed. Very few non-calculator methods were successful. Parts (b) and (c) differentiated at the upper end. In part (b) candidates failed to understand how to get to the answer; those few who did usually gained the full marks. In part (c) most candidates assumed you could merely find 4% and subtract it; few demonstrated understanding of the use of 1.04.

17.   **Foundation Tier**

It is disappointing to report that only a small proportion of candidates could successfully complete this question involving the use of a simple percentage. Even though the numbers used should have made this question accessible, many candidates merely added £15 on to the cost of the ticket (£45) to give an answer of £60. Of those who were able to calculate 15% of £45, it was common to see £6.75 on the answer line rather than the total when this is added to the £45.

Some candidates deducted the booking charge. Only about 10% of candidates could give a fully correct answer to this question.

Intermediate Tier

This was a well answered question, which showed some improvement from previous years. A greater proportion performed the calculation for finding the percentage correctly, multiplying rather than dividing. There remains a considerable use of non-calculator "break-down" methods seen, that is where they attempt to find 10%, then 5%, which usually results in incorrect working due to the increased risk of error. Common errors were calculating 15% of 45 as 45/15, or working out 15% without adding this back on. There was a slight increase in the proportion of candidates using single step methods ($\times$ 1.15 or equivalents) but most candidates preferred the security of working out the 15% separately, then adding it back on.

18.   Most candidates appeared to possess a calculator, and where able to perform the correct operations. In part (a) most success was demonstrated when candidates wrote down the denominator and numerator as a single number, and then performed the division. Many arrived at the final answer. Predictably the most common incorrect answer was -3, from those candidates who just entered the numbers in their calculator as given, without thinking about the order of operations: $4.7 \div 9.4 - 3.5$. In part (b) it was encouraging to see so many candidates achieving success. Most gained some credit for their efforts; many knew how to convert between fractions and decimals. Where errors were made, it was most frequently the fractions 2/3 and 7/8 that were most frequently in the wrong position.

19.   **Higher Tier**

Only a few candidates treated this question as a calculation involving simple interest. Many candidates carried out a correct calculation to find the total amount in the account after 3 years. This did this either by a year by year method, finding £2110, £226.05 and then 2348.48…, or from £2000 × 1.055^3. Sadly, many overlooked the demand in the question and left the answer as the final amount, rather than the interest.

Intermediate Tier

Sound percentage calculations demonstrated in question 14 were demonstrated again here, with most candidates able to work out 5.5% of £2000, though some found 55% or 0.55% by confusing the position of the decimal point in their calculation. Whilst this would have assisted in them gaining full marks in a simple interest question, this was compound interest, and few recognised is as such. Of those who did, many then failed to answer the question as given in bold, instead presenting the final amount in the account, rather than the total interest earned. Candidates who used "single step" methods were confused by the factor to be used, with many choosing an incorrect figure of 1.55 instead of 1.055, and in this respect a more secure method of "year by year" calculations resulted in a greater success rate.

20.   **Foundation Tier**

It was rare for marks to be gained on this question. A common answer was 21 by calculating the number of guests who were female. Some managed to obtain a mark in part (a) by realising 50% was 28, 25% 14 and half of this 7 and then putting 28 and 7 together to make 35. In part (b) the correct answer of ¼ without working gained full marks and was probably either a good guess or from thinking 40% = ¼.

Intermediate Tier

Candidates seemed to find part (a) very difficult and relatively few used the conventional method, 35/56×100, for writing one number as a percentage of another. Many of those that did could not complete the calculation correctly. The majority of candidates tried to find percentages of 56, e.g. 50% = 28, 25% = 14, but this method usually failed when they went on to give 10% = 5.6 and 1% = 0.56. The successful ones realised that 28 + 7 = 35 and used 50% = 28 and 12.5% = 7. A significant number of candidates attempted to evaluate 35% of 56. Candidates were more successful in part (b). Many were able to find 40% of 35, often by finding 10% and multiplying by 4. It would appear that some had not read the question carefully enough because they did not make any attempt to write 14 as a faction of 56 or they wrote it as a fraction of 35. More than half of those who did go on to write 14/56 lost the final mark because they did not give the answer in its simplest form. Answers of 14/56, 7/28 and 2/8 were common.

21.   Attempts to this question were very disappointing and it was rare to see a correct answer or any completely correct working.. It appears that most candidates do not understand how to calculate a percentage of a quantity efficiently using a calculator. From the evidence seen, many candidates appeared to have merely multiplied or divided £4500 by 36.

22. **Foundation Tier**

Answers seen to part (a) of this question showed that candidates usually identified the correct method but that many were thwarted by their inability to deal correctly with place value when dealing with money. As they had shown their intention to multiply the correct quantities, examiners were often able to award candidates at least two of the marks available. Significantly fewer candidates were able to answer part (b) correctly, particularly the simplification of the fraction. There were very few correct answers to part (c). Many candidates who attempted this part just added £17.50 to £360 and gave an answer of £377.50.

Intermediate Tier

The majority of candidates showed intent to multiply the correct amounts in part (a), but were not always able to convert one or the other or both to £, so losing the accuracy mark. Many candidates used long multiplication methods rather than using their calculators. In part (b) 15/450 was seen in most cases, but a significant number could not then simplify this fraction. In part (c) those candidates who relied on non-calculator methods rarely accessed any marks. A significant number either added or divided the 17.5.

23. Few marks were gained in this question. In part (a) candidates subtracted 376 from 451 but could rarely go any further. The problem was conversion to a percentage increase. In part (b) there was again a dearth of working. Of those many giving the wrong answer and shoeing some evidence, it was clear that division by 8 and multiplication by 3 was common, but the decimal 3.2 and mention of millions was sufficient to distract them from completing the problem successfully. A concern is the significant number who say km^2 on the answer line and took this cue to square the 3.2 in the question.

24. There were several successful approaches to this question, the most common being $\frac{75}{376} \times 100$.

Another efficient approach was to calculate $\frac{451}{376} \times 100$ and then subtract 100. As candidates had calculators available, there were some who worked out various percentages of 376 looking for 75. Some candidates were able to find an answer in the interval 19.9% to 19.95%, but many left the answer as 20% which scored no marks unless there had been working shown.

The most common errors apart from the one above were firstly $\frac{75}{451} \times 100$, and secondly, 119.9 by forgetting to subtract 100.

25.   **Higher Tier**

Responses generally fell into 3 groups. The first group consisted of those who treated the problem as one involving simple interest. The second group treated the problem correctly and the third group generally used a correct method, but over three years. An increasing number of candidates seem to be using the more efficient method of multiplying by 1.05^2 rather than taking one year at a time.

Intermediate Tier

A significant number of candidates treated this question as a simple interest problem as was evident from many answers of £2100 and £2200. It was the minority of candidates who gained full marks.

26.   The majority of candidates gave their answer as ratios, but the weaker candidates used fractions. Those candidates who gave their answer as a ratio often left their answer as 84:16 or made errors when cancelling. A significant number of candidates reversed the order of the ratios.

27.   It was usual to award some method marks in some part of this question, but few answers both parts correctly. Lots of candidates wrote their answer as 10:35, misreading the question. Trial and improvement methods were also seen. It is a real concern that so many candidates had little idea with regard to calculating percentages. Many non-calculator methods were seen, which rarely attracted any marks due to the many numerical errors that accompanied them. Some candidates went as far as calculating the VAT, but then failed to add it on to find the total.

28. Part (a) was very well done. A few candidates wrote down both 10 and 35 without identifying which value answered the question. They got one of the two marks.

Part (b) was also very well done with a majority of answers involving multiplying by $\dfrac{117.5}{100}$ to get the answer directly. Of course, there were a considerable number who worked out $80 \times \dfrac{17.5}{100}$ and added the answer to 80.

A few took the $8 + 4 + 2$ route to get to the £94.

The main errors were a failure to add the £14 to £80 and a miscalculation on the £8 + £4 + £2, usually at the $2\dfrac{1}{2}\%$ stage.

Part (c) was a standard depreciation question. It was pleasing to see so many students using the efficient 12000×0.8^2 although many who used a careful step by step approach also gained full marks. A common misread was 1200 for 12000, which resulted in the loss of 1 mark. A few candidates added on the 20%.

Of course, there were many candidates who worked out 20% of £12000 and then subtracted 2 × 2400 to get the wrong answer £7200

29. Part (a) was a percentage change question made a little more challenging by the relevant numbers being in a table. It was extremely rare for anything other than the 85 and 91 to be chosen. However, apart from that the remaining working was not good. Many candidates had little idea how to proceed and wrote 6% presumably from 91 -85. Others knew they had to convert a fraction to a percentage, but used a denominator of 91. Another common error was to calculate either $\dfrac{91}{85}$ or $\dfrac{91}{85} \times 100$ and then omit the subtraction of either unity or 100. Some candidates adopted a trial and improvement approach but rarely got to within the demanded level of accuracy.

Part (b) was a standard moving average question. There were many correct answers, but also many candidates did not know where to start and left a blank or worked out the average of all the figures.

30. This question differentiated well between candidates. Part (a) was quite well done, many candidates using a diagrammatic representation or writing down lists to help them understand the situation. These methods commonly lead to the award of at least 2 of the 3 marks available. Poor arithmetic affected some candidate's responses whilst others just worked out the cost of 12 tins (£4.80) or of 6 tins. This latter group seemed to be under the illusion that the offer was equivalent to "buy one, get one free". Many attempts to part (b) of the question gave $\dfrac{9}{12}$ as the relevant fraction, but commonly candidates were unable to convert this to a percentage. 44% of candidates scored full marks in part (b). Part (c) was quite well done. Some candidates worked out the price reduction but did not subtract it from the normal price to find the sale price. Weaker candidates merely subtracted 15(%) from (£)20 and gave the answer £5.

31.   In part (a), most candidates realised the need to pay for 8 tins of cat food in order to get 12; however a significant number of candidates made arithmetic errors in their calculation of 40 × 8 Some candidates just worked out the cost of 12 tins, while many assumed the offer was "buy one get one free" and just calculated the cost of 6 tins.

   Part (b) was generally answered well with most candidates able, with whatever method, to correctly work out 15% of £20. However a common error was to say 10% = £2, then 5% = £4 rather than £1. A significant number of candidates did not then subtract the reduction from £20 and thus failed to score the final mark.

32.   Those candidates who multiplied by 0.175 or by 1.175 usually got the correct answer. The addition of 17.5 to 240 was a popular incorrect method. Many candidates still persist in working 17.5% of 240 out in parts using non-calculator methods and making errors; there were many who attempted to fins 10%, 5%, 2.5% or 10%, 5%, 1%, 0.5%. A significant number of candidates successfully worked out the amount of VAT but then subtracted rather than added this to the list price. Very few showed 4/100 × 3000 as working. Significantly, nearly 20% of candidates failed to score any marks on this question.

33.   Around 30% of candidates used simple interest only and therefore gained 1 mark out of the 3 available; 3120 and 6240 were common incorrect answers. A significant number of candidates could not work out 4% of 3000, 24% of candidates failed to gain any marks in this question.

34.   A significant number of candidates demonstrated an inability to calculate a percentage increase and produced a wide range of incorrect answers including 6% (38 − 32), 19.12% ($\frac{32}{100} \times 6$), 12.16% ($\frac{32}{100} \times 38$) and 15.8% ($\frac{6}{32} \times 100$). Of those candidates who performed correct percentage calculations most went on to justify their conclusion correctly although a significant number failed to, usually quoting "yes" or "no" only.

35.   Those candidates with some understanding of percentages scored at least 1 mark in this question, and often more. Compound interest methods were common.
   Weaker candidates often chose any calculation involving 4.5, 530 and 3 and usually gained no marks.

36.   Most attempted this question but with varying success. Many tried finding 50% and 25% by dividing by 2 but then did not know how to carry on subtracting a further 2%.
         Many found 10% and 1% and tried to combine multiples of these answers to get 23% with varying success. Others wrote the answer without any working. There were a large variety of incorrect answers with no workings that did not enable examiners to have any insight as to how they were achieved. Candidates should be encouraged to show working on the calculator paper too as the statement '$64 \times \dfrac{23}{100}$' would have been rewarded even if the subsequent calculator process went wrong.

37.   This question was poorly done with many candidates demonstrating an inability to calculate a percentage of a quantity, even with the aid of a calculator, 3500 divided by 4 was not uncommon. Those using build up methods to find percentages often quoted 10% as £35. Many candidates divided £3500 into 3 parts for each year. Of those candidates who were able to calculate percentages, often the new principle was given (this was accepted if the interest of £420 had been clearly stated) or compound interest was calculated, gaining just 1 mark for the correct interest after one year. A few candidates realised that 12% of £3500 was required but again could not complete the calculation.

38.   The majority of candidates were able to score full marks on this question. Weaker candidates did, however, attempt to increase 32 by 20% thus scoring no marks.

39.   Over half (54%) gained full marks in this question. The most popular method was $36/100 \times 94$ calculated using a calculator. Build up methods were sometimes successful but often failed to gain even 1 mark when the method was not explicit. Answers of £60.16 (94 – 33.84) were given full credit provided that 33.84 had been seen in the working, £60.16 alone gained 1 mark only. $36/94 \times 100 = 38.29(30)$ was frequently seen.

40.   Candidates scored well in this question with many gaining two or more marks. Many failed to score full marks simply by giving the reduction of £7.36 rather than the reduced price. A number of candidates chose not to use their calculators, preferring 'build up' methods which often resulted in a wrong answer owing to arithmetic errors, for example 10% = 0.368 or 10% = 3.6 A few candidates misread this question as a reverse percentage type question.

41.   With the aid of a calculator, it was pleasing to see candidates making a much better attempt at this type of question than has been recently the case. Often candidates, having not fully read the question, left their answer as £42 and failed to find the subsequent reduced price. Weaker candidates often just subtracted 35 from 120 to give an incorrect answer of £85. Other loss of marks tended to be a result of dividing 35 by 120 and then multiplying (or in some cases dividing) by 100.

42.   No report available.

43.   Candidates started this question with confidence. Over 75% realised that they needed to multiply £4.50 by 10 to obtain £45 and most of these candidates then went on to reach £50 in (a). However, things started to go downhill from there! Less than a quarter were able to ascertain that they needed to subtract £13 and many of those that did reach £13 then failed to reach the answer of £52 in (b).

44.   Whilst most candidates did score full marks, a significant number correctly found the VAT as £8.75 but then either subtracted it from £50 or just stated it as their answer. Many candidates using a partitioning method often made a mistake when finding the $\frac{1}{2}$ %.

45.   Foundation

Calculating the deposit of 30% was generally not well handled with only 36% gaining full marks. A range of methods was used to calculate the percentage. However, it was clear that the majority did not understand how to work out the deposit with many answers of £420 (450 – 30) and £150 (450 ÷ 3).

Higher

Calculating the deposit of 30% was generally well handled with 84% gaining full marks. A range of methods was used to calculate the percentage and the sum of £135 appeared in the majority of responses. Following this were calculations of £450 – £135 leading to a final answer of £315 which took the question beyond that which was required but was awarded full marks. In the other direction £450 + £135 = £585 only gained one mark as the value of £585 was meaningless in the context of the question. The most common error was to divide 450 by 30 or by 3. Several of the candidates took 30% to mean 1/3 and gave an answer of £150.

46. There were varied responses to this question. Some candidates tried to change the marks into percentages, others turned them into decimals and others tried to work in equivalent fractions whilst a sizeable minority tried to work on the number of marks that students got wrong and another sizeable minority thought they could change the second mark into a percentage by doubling. Another common error made by the candidates was to add 50 to the 42 and then 50, or 40, to the 48 in an attempt to make them out of 100. Fully correct solutions were seen by 27% of candidates whilst those candidates that dealt with one mark correctly obtained 2 marks; this was gained by 12% of candidates. 48% of candidates did not score any marks in this question.

47. This questions was very poorly done with just over one quarter of candidates gaining full marks. The majority of candidates were unsure what figures to use to come up with a percentage the fractions 85/91, 6/176, 85/176, 91/176, 6/176 and 6/95 were all popular incorrect starting points.

48. This question was also well understood with 84% of candidates scoring the mark for an answer of £30 or £30.00. It was disappointing to see that some candidates either could not find 15% of £200 or wrote down the answer as £230 or £170 and could not be awarded the single mark as they had not understood the question.

49. Relatively few candidates used their calculator efficiently to complete this question. 39% of candidates gained some credit for their answers, usually 2 marks. Many candidates used the method of working out 10% and 5% of 240 first. Candidates who attempted to use 25% and 10% were less successful, usually because they tried to work out 10% from their 25% rather than dividing 240 by 10. Of the large number of unsuccessful attempts, many candidates simply multiplied 35 by 240 to give 8400 as their answer. A significant minority of candidates decreased 240 by 35%. Where working was shown, credit was given for this answer.

50. Just over a third of the candidates were able to find the given test score as a percentage. Relatively few started their answer by first writing down the calculation $\frac{14}{20} \times 100$. A common incorrect method was to correctly working out 75% of 20 to get 15 and then incorrectly subtracting 1 to get 74%. Another common incorrect method was $\frac{14}{100} \times 20$. Partitioning methods were rarely successful.