

Edexcel GCSE

Mathematics

Foundation 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 108 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.

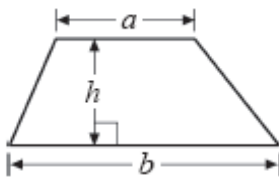
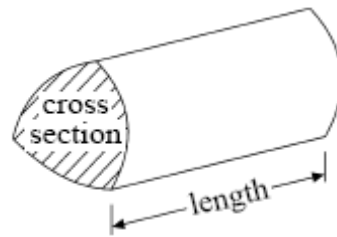
Information for teachers

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” so could have (though not necessarily) appeared on either a Foundation or Intermediate 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 \times length

1. In a survey, some families were asked to name their favourite supermarket. Some of the results are shown in the diagram.



- (a) Write as a **fraction** the percentage whose favourite supermarket was Montrose.

.....

(1)

- (b) Write as a **decimal** the percentage whose favourite supermarket was Salisbury.

.....

(1)

200 families took part in the survey.

- (c) Work out the number of families whose favourite supermarket was Tresco.

.....

(2)

(Total 4 marks)

2. Nassim buys petrol from his local garage.

On Monday, he filled up his tank.

On Tuesday, his tank was $\frac{3}{4}$ full.

- (a) What fraction of the full tank of petrol had he used?

..... (1)

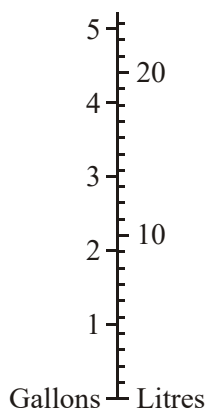
- (b) Write $\frac{3}{4}$ as a decimal.

..... (1)

- (c) Write $\frac{3}{4}$ as a percentage.

..... (1)

The garage has a diagram for converting gallons to litres.



(d) Use the diagram to convert

(i) 2 gallons to litres,

..... litres

(ii) 3.5 gallons to litres.

..... litres

(2)
(Total 5 marks)

3. Simon repairs computers.
He charges

£56.80 for the first hour he works on a computer and
£42.50 for each extra hour's work.

Yesterday Simon repaired a computer and charged a total of £269.30

(a) Work out how many hours Simon worked yesterday on this computer.

..... (2)

Simon reduces his charges by 5% when he is paid promptly.
He was paid promptly for yesterday's work on the computer.

(b) Work out how much he was paid.

£ (3)
(Total 5 marks)

4. A customer who cancels a holiday with Funtours has to pay a cancellation charge. The cancellation charge depends on the number of days before the departure date the customer cancels the holiday. The cancellation charge is a percentage of the cost of the holiday. The table shows the percentages.

Number of days before the departure date the customer cancels the holiday	Percentage of the cost of the holiday
29–55	40%
22–28	60%
15–21	80%
4–14	90%
3 or less	100%

The cost of Amy’s holiday was £840.
She cancelled her holiday 25 days before the departure date.

- (a) Work out the cancellation charge she had to pay.

£

(2)

The cost of Carol’s holiday was £600.
She cancelled her holiday and had to pay a cancellation charge of £480.

- (b) Work out £480 as a percentage of £600.

..... %

(2)

Ravi cancelled his holiday 30 days before the departure date.
He had to pay a cancellation charge of £272.

(c) Work out the cost of his holiday.

£

(2)

(Total 6 marks)

5. There are 800 students at Prestfield School.

144 of these students were absent from school on Wednesday.

(a) Work out how many students were **not** absent on Wednesday.

.....

(2)

Trudy says that more than 25% of the 800 students were absent on Wednesday.

(b) Is Trudy correct? Explain your answer.

.....

.....

(2)

45% of these 800 students are girls.

(c) Work out 45% of 800

..... (2)

There are 176 students in Year 10.

(d) Write 176 out of 800 as a percentage.

.....% (2)
(Total 8 marks)

6. There are 800 students at Prestfield School.

45% of these 800 students are girls.

(a) Work out 45% of 800

..... (2)

There are 176 students in Year 10.

- (b) Write 176 out of 800 as a percentage.

.....%

(2)

(Total 4 marks)

7. (a) Write these five fractions in order of size.
Start with the smallest fraction.

$$\frac{3}{4} \quad \frac{1}{2} \quad \frac{3}{8} \quad \frac{2}{3} \quad \frac{1}{6}$$

.....

(2)

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

$$65\% \quad \frac{3}{4} \quad 0.72 \quad \frac{2}{3} \quad \frac{3}{5}$$

.....

(2)

(Total 4 marks)

8. The table gives information about an estate agent's charges for selling a house.

Value of the house	Estate agent's charges
Up to £60 000	2% of the value of the house
Over £60 000	2% of the first £60 000 plus 1% of the remaining value of the house

The estate agent sold a house for £80 000.

Work out the total charge.

£.....

(Total 4 marks)

9. Fred went on holiday to France.
He changed £475 to Euros.
£1 = 1.57 Euros.

(a) Change £475 to Euros.

..... Euros

(2)

In France, Fred went to a festival.
There were 650 people at the festival.
16% of the people at the festival were British.

(b) Work out 16% of 650

.....

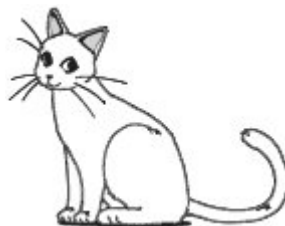
(2)

(Total 4 marks)

10.

Cat facts

- 40% of people named cats as their favourite pet.
- 98% of women said they would rather go out with someone who liked cats.
- About $7\frac{1}{2}$ million families have a cat.
- $\frac{1}{4}$ of cat owners keep a cat because cats are easy to look after.



- (a) Write 40% as a fraction.
Give your fraction in its simplest form.

..... (2)

- (b) Write 98% as a decimal.

..... (1)

- (c) Write $7\frac{1}{2}$ million in figures.

..... (1)

- (d) Write $\frac{1}{4}$ as a percentage.

.....% (1)

- (e) What percentage of people did **not** name cats as their favourite pet?

.....% (1)
(Total 6 marks)

11. The table below shows the cost of each of three calculators.

Compact	£2.30
Studio	£2.15
Basic	£2.80

Barbara buys one Studio calculator and one Compact calculator.

She pays with a £10 note.

(a) How much change should she get?

£.....

(4)

Mrs Brown wants to buy some Basic calculators.

She has £60 to spend.

(b) Work out the greatest number of Basic calculators she can buy.

.....

(2)

Mrs Brown gets a 25% reduction if she spends £120 or more.

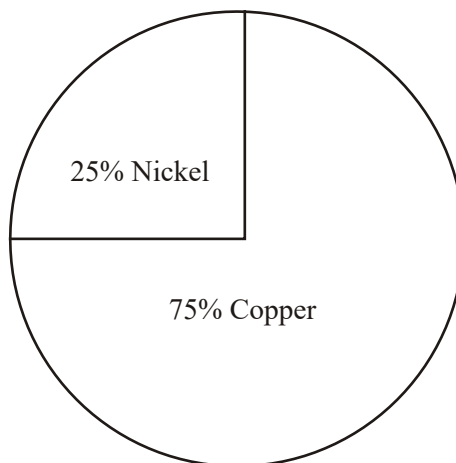
(c) Work out 25% of £120

£.....

(2)

(Total 8 marks)

12.



The weight of a coin is 25% nickel and 75% copper,

- (a) (i) Write 25% as a decimal.

.....

- (ii) Write 25% as a fraction.
Give your answer in its simplest form.

.....

(2)

The weight of a coin is 8 grams.
25% of the weight is nickel and 75% of the weight is copper.

- (b) (i) Work out 25% of 8 grams.

.....grams

- (ii) Work out 75% of 8 grams.

.....grams

(2)

(Total 4 marks)

13. A newspaper reporter did a survey.
He asked people what was their favourite leisure activity.

The table gives some information about the answers he got.

Favourite leisure activity	Percentage
Home Improvements	22%
Shopping	14%
Gardening	9%
All others	

- (a) Complete the table.

(1)

(b) Write 9% as a decimal.

.....

(1)

400 people were asked in the survey.

(c) How many people said their favourite leisure activity was gardening?

.....

(2)

(Total 4 marks)

14. A train travels from London to Manchester.

It leaves London at 16 55

It arrives in Manchester at 19 45

(a) Work out the number of minutes this train takes to travel from London to Manchester.

.....

(3)

There are 800 people on the train at Manchester.

$\frac{1}{10}$ of these 800 people are children.

(b) (i) Work out $\frac{1}{10}$ of 800

.....

$\frac{3}{8}$ of those 800 people are women.

(ii) Work out $\frac{3}{8}$ of 800

.....

The rest of the 800 people are men.

(iii) Work out the number of men on the train.

.....

(4)

320 of the 800 people are under 21 years old.

(c) Work out 320 out of 800 as a percentage.

.....%

(2)

(Total 9 marks)

15. (a) Write $\frac{1}{10}$

(i) as a decimal,

.....cm

(ii) as a percentage.

.....cm

(2)

(b) Shade $\frac{3}{5}$ of this shape.

(1)
(Total 3 marks)

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

There are 3 shops that sell the trainers he wants.

<p>Sports '4' All</p> <p>Trainers</p> <p>£5</p> <p>plus</p> <p>10 payments of £4.50</p>	<p>Edexcel Sports</p> <p>Trainers</p> <p>$\frac{1}{5}$ off</p> <p>usual price of</p> <p>£65</p>	<p>Keef's Sports</p> <p>Trainers</p> <p>£50</p> <p>plus</p> <p>VAT at 17½%</p>
--	---	---

(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)

17. The table shows the percentage of each of the materials used in making a car tyre.

Material	Percentage
Natural rubber	12%
Synthetic polymers	25%
Carbon black	26%
Oil	17%
Fabric	4%
Wire	10%
Other	6%

- (a) Write down the name of the material with the largest percentage.

.....

(1)

- (b) Write 10% as a decimal.

.....

(1)

- (c) Write 4% as a decimal.

.....

(1)

- (d) Write 26% as a fraction.
Give your answer in its simplest form.

.....

(2)

(Total 5 marks)

18.

Shape A

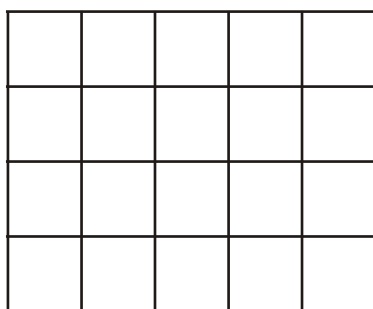


(a) What fraction of Shape A is shaded?

.....

(1)

Shape B



(b) (i) Shade 20% of Shape B.

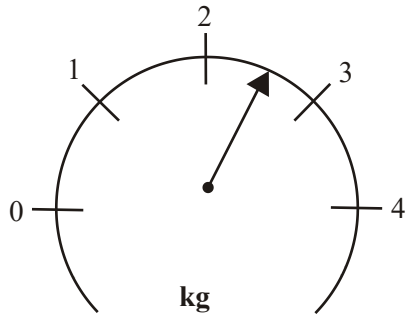
(ii) What percentage of shape B is **not** shaded?

..... %

(2)

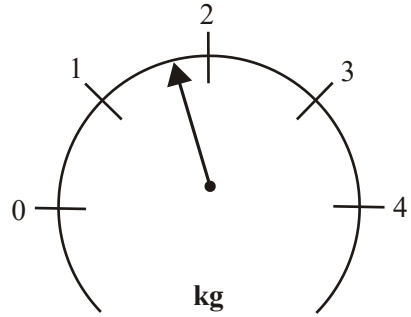
(c) What is the reading on each of these scales?

(i)



(i) kg

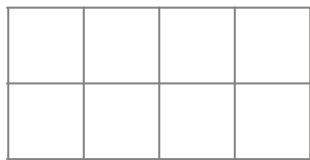
(ii)



(ii) kg

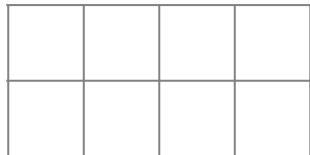
(2)
(Total 5 marks)

19. (a) Shade $\frac{3}{4}$ of this shape.



(1)

(b) Shade 0.25 of this shape.



(1)

(c) Change 0.3 into a fraction.

.....

(1)

(d) Change 0.7 into a percentage.

..... % (1)

(e) Work out $\frac{3}{4}$ of £36

£ (2)
(Total 6 marks)

20. (a) Write 92% as a decimal.

..... (1)

(b) Write 3% as a fraction.

..... (1)

- (c) Work out 5% of 400 grams.

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

21. (a) Work out the square of 3

..... (1)

- (b) Work out the value of 2^6

..... (1)

- (c) Write 80% as a fraction.
Give your answer in its simplest form.

..... (2)

(d) Work out 10% of £320

£

(2)

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

$\frac{2}{5}$ 45% 0.35 $\frac{3}{8}$

.....

(2)

(Total 8 marks)

22. A television reporter did a survey.
She asked people to name their favourite sport.
The table gives some information about the answers she got.

Favourite Sport	Percentage
Football	30 %
Cricket	14 %
Hockey	9 %
Snooker	8 %
Tennis	4 %
Other

(a) Complete the table.

(1)

(b) Write down the percentage of people who said snooker.

..... % (1)

(c) Write 30% as a fraction.
Give your answer in its simplest form.

..... (2)

(d) Write 9% as a decimal.

..... (1)

2000 people took part in the survey.

(e) Work out the number of people who said cricket.

..... (2)

40 people said golf.

(f) Work out 40 out of 2000 as a percentage.

..... %
(2)
(Total 9 marks)

23. Work out 28% of £85 000

£
(Total 2 marks)

24. (a) Work out 50% of £60

£ (1)

(b) Work out 25% of 20 metres.

..... metres

(1)

(Total 2 marks)

25. There are 600 counters in a bag.

90 of the counters are yellow.

(a) Work out 90 as a fraction of 600
Give your answer in its simplest form.

.....

(2)

180 of the 600 counters in the bag are red.

(b) Work out 180 as a percentage of 600

..... %

(2)

The rest of the counters in the bag are blue or green.
There are twice as many blue counters as green counters.

(c) Work out the number of green counters in the bag.

.....

(2)
(Total 6 marks)

26. (a) Work out $\frac{3}{5}$ of 185.

.....

(2)

(b) Work out 12% of £9.50.

.....

(2)
(Total 4 marks)

27. (a) Find the positive square root of 2.56.

.....

(1)

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

$$0.4 \quad \frac{7}{15} \quad 35\% \quad \frac{3}{7}$$

.....

(2)
(Total 3 marks)

28. (a) Write 0.45 as a percentage.

.....%

(1)

- (b) Write $\frac{3}{4}$ as a percentage.

.....%

(1)

- (c) Write 30% as a fraction in its simplest form.

.....

(2)
(Total 4 marks)

29. (a) Write $\frac{1}{5}$ as a percentage.

..... % (1)

- (b) Write 0.7 as a percentage.

..... % (1)
(Total 2 marks)

30. (a) Write $\frac{1}{4}$ as a percentage.

..... % (1)

- (b) Write 0.23 as a percentage.

..... % (1)

- (c) Write 42% as a fraction.
Give your answer in its simplest form.

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

31. Here are six numbers

$$75\% \quad \frac{8}{10} \quad \frac{9}{12} \quad 0.75 \quad 66\frac{2}{3}\% \quad \frac{6}{8}$$

Two of the numbers are **not** equal to $\frac{3}{4}$

Draw a circle around each of the two numbers.

(Total 2 marks)

32. (a) Write 0.38 as a percentage.

..... %

(1)

(b) Write $\frac{3}{10}$ as a percentage.

..... %

(1)

(Total 2 marks)

33. Work out 45% of 800

.....
(Total 2 marks)

34. Linda's mark in a maths test was 36 out of 50
Find 36 out of 50 as a percentage.

..... %
(Total 2 marks)

35. Jessica's annual income is £12 000
 She pays 10% of the £12 000 in rent.
 She spends $\frac{1}{4}$ of the £12 000 on clothes.
 Work out how much of the £12 000 Jessica has left.

£
 (Total 3 marks)

36. (a) Write $\frac{1}{5}$ as a percentage.

..... % (1)

- (b) Write 0.64 as a percentage.

..... % (1)

- (c) Write 70% as a decimal.

..... (1)
 (Total 3 marks)

37. William's salary is £24 000
His salary increases by 4%.

Work out William's new salary.

£

(Total 3 marks)

38. (a) Write 0.37 as a percentage.

..... % (1)

- (b) Write $\frac{1}{4}$ as a percentage.

..... % (1)

- (c) Write 19% as a fraction.

..... (1)

- (d) Write 40 as a fraction of 140
Give your fraction in its simplest form.

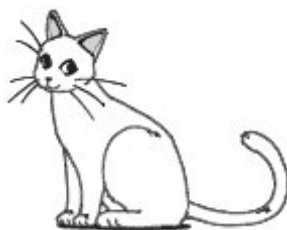
.....

(2)
(Total 5 marks)

39.

Cat facts

- 40% of people named cats as their favourite pet.
- 98% of women said they would rather go out with someone who liked cats.
- About $7\frac{1}{2}$ million families have a cat.
- $\frac{1}{4}$ of cat owners keep a cat because cats are easy to look after.



- (a) Write 40% as a fraction.
Give your fraction in its simplest form.

.....

(2)

(b) Write $7\frac{1}{2}$ million in figures.

.....

(1)

(c) What percentage of people did **not** name cats as their favourite pet?

..... %

(1)

(Total 4 marks)

40. 12. The cost of a book is £2.80
Mrs Brown has £60 to spend.

(a) Work out the greatest number of these books that Mrs Brown can buy.

.....

(2)

Daniel is going to buy a computer game for £40.
The price of the computer game is reduced by 20%.

- (b) Work out the price Daniel pays for the computer game.

£

(3)
(Total 5 marks)

41. Work out 70% of £340

£

(Total 2 marks)

42. (a) Write 0.85 as a percentage.

..... %

(1)

(b) Write $\frac{1}{10}$ as a percentage.

..... % (1)

(c) Write 60% as a decimal.

..... (1)

(Total 3 marks)

43. Kunal bought a bag of oranges for £5
He sold the bag of oranges.
He made a profit of 20%.

Work out how much he sold the bag of oranges for.

£..... (Total 3 marks)

44. Write these numbers in order of size.~
Start with the smallest number.

$\frac{1}{3}$ $\frac{3}{8}$ $0.3 \times 35\%$

..... (Total 2 marks)

45. (a) (i) Write $\frac{1}{4}$ as a percentage.

.....%

(ii) Write 0.8 as a percentage.

.....% (2)

(b) Write 76% as a decimal.

..... (1)

(c) Write 45% as a fraction.
Give your answer in its simplest form.

..... (2)
(Total 5 marks)

46. (a) Write 37% as a fraction.

..... (1)

(b) Work out 37% of £415

£ (2)
(Total 3 marks)

47. (a) Write 0.15 as a percentage.

.....% (1)

- (b) Write 35% as a fraction.
Give your answer in its simplest form.

.....

(2)
(Total 3 marks)

48. Work out 35% of £400

£

(Total 2 marks)

49. 83% of the houses in Spring Road have a satellite dish.

What percentage of the houses in Spring Road do **not** have a satellite dish?

.....%

(Total 1 mark)

50. (a) Write 0.24 as a percentage.

..... % (1)

- (b) Write 0.7 as a percentage.

..... % (1)

- (c) Write $\frac{1}{4}$ as a percentage.

..... % (1)

- (d) Work out $3 \times \frac{1}{5}$

..... (1)

- (e) Write 7 centimetres as a fraction of 2 metres.

..... (2)
(Total 6 marks)

51. There are some pens in a box.
The pens are red, blue, green or black.

The table shows the percentage of red, blue and green pens in the box.

Colour of pen	Percentage
Red	23 %
Blue	32 %
Green	10 %
Black	

Work out the percentage of black pens in the box.

..... %
(Total 2 marks)

52. (a) Change $\frac{1}{4}$ to a decimal.

..... (1)

- (b) Find 10% of £50

£ (1)
(Total 2 marks)

53. (a) Write 25.2 to the nearest whole number.

..... (1)

(b) Write $\frac{1}{5}$ as a decimal.

..... (1)

(c) Write 27% as a fraction.

..... (1)
(Total 3 marks)

54. (a) Write $\frac{9}{10}$ as a decimal.

..... (1)

(b) Write $\frac{3}{4}$ as a percentage.

..... % (1)

(c) Write 23% as a fraction.

..... (1)

(d) Work out $\frac{1}{5}$ of 50

..... (1)
(Total 4 marks)

55. Kaz buys a car.
The normal price of the car is £7200

Kaz gets a 10% discount.

(i) Work out 10% of £7200

£

- (ii) Work out how much Kaz pays for the car.

£
(Total 3 marks)

01. (a) $\frac{7}{100}$ 1
BI cao accept 0.07

(b) 0.18 1
BI cao

(c) 40 2
20 in 100 oe
M1 for sight of 20 in 100 or 20×2
AI cao

[4]

02. (a) $\frac{1}{4}$ oe 1
BI cao

(b) 0.75 1
BI cao

(c) 75% 1
BI cao

(d) (i) 9 2
B1 accept answer in range 9 – 9.2

(ii) 15 - 16
B1 accept answers in range 15 – 16

[5]

03. (a) 6 2

$$269.30 - 56.80 = 212.50$$

$$\frac{212.50}{42.50}$$

$$\text{M1 for } \frac{269.30 - 56.80}{42.50} \text{ or 5 seen}$$

A1 cao

(b) 255.83 or 255.84 3

5% of £269.30

£269.30 – “£13.465”

OR $\frac{95}{100} \times 269.30$

M1 for $(5 \div 100) \times 269.30$

M1 for $269.30 - “13.465”$

A1 cao

OR M2 for $\frac{95}{100} \times 269.30$

A1 cao

Alternative Method:

M1 for $\frac{5}{100} \times 56.80 (= 2.84)$

and $\frac{5}{100} \times 42.50 (= 2.12(5))$

(OR 53.96 AND 40.38 (40.375) seen

M1 for $56.80 - “2.84” (= 53.96)$

$42.50 - “2.12(5)” (= 40.375 \text{ or } 40.38)$

“5” \times “40.375” + “53.96”

A1 cao

[5]

04. (a) 504

2

$$\frac{60}{100} \times 840$$

MI e.g. for $\frac{60}{100} \times 840$

Al cao

(b) 80

2

$$480 \div 6$$

MI for $480 \div 6$ oe

Al cao

(c) 680

2

$$10\% = 68, 20\% = 136 \text{ or}$$

$$\frac{100}{40} \text{ oe seen}$$

MI for $10\% = 68, 20\% = 136$ or $\frac{100}{40}$ oe seen

Al cao

[6]

05. (a) 656 2
800 – 144

MI for at least 1 digit correct and in correct position needs to be 3 digit number
AI for 656

- (b) 144 is less than 200 so Trudy is wrong 2
B1 for 200
B1ft for 'correct' explanation based on cand's "200"

- (c) 360 2
$$\frac{45 \times 800}{100}$$

MI for $45 \times 800 \div 100$ oe
AI for 360

- (d) 22 2
$$\frac{176}{800} \times 100$$

MI for $\frac{176}{800} \times 100$ oe
AI for 22

[8]

06. (a) 360 2
$$\frac{45}{100} \times 800$$

MI for $\frac{45}{100} \times 800$ oe
AI for 360

- (b) 22 2
$$\frac{176}{800} \times 100$$

MI for $\frac{176}{800} \times 100$ oe
AI for 22

[4]

07. (a) $\frac{1}{6}, \frac{3}{8}, \frac{1}{2}, \frac{2}{3}, \frac{3}{4}$ 2
B2 for all correct
(B1 for 1 error or all correct but wrong order, or use of a common denominator decimals).
- (b) $\frac{3}{5}, 65\%, \frac{2}{3}, 0.72, \frac{3}{4}$ 2
B2 for all correct
(B1 for 1 error or all correct but wrong order or conversions to decimals oe)
- [4]**
08. £1400 4
 $2 - 100 \times 60\,000$
 $1 - 100 \times 20\,000$
 Total = £1400
M1 for $2 - 100 \times 60\,000$ or $2 - 100 \times 80\,000$
A1 for 1200 or 1600
M1 for intention to find 1% of 20000
A1 for 1400 cao
- [4]**
09. (a) 745.75 2
 475×1.57
M1 for 475×1.57
A1 cao
- (b) 104 2
 650×0.16
M1 for $650 \times \frac{16}{100}$
A1 cao
- [4]**

10. (a) $\frac{2}{5}$ 2

$\frac{40}{100}$

B2 for $\frac{2}{5}$
B1 for $\frac{40}{100}$ or $\frac{4}{10}$ or $\frac{20}{50}$ or $\frac{8}{20}$

(b) 0.98 1

B1 cao

(c) 7 500 000 1

B1 cao

(d) 25 1

B1 cao

(e) 60 1

B1 cao

[6]

11. (a) 5.55 4

$\pounds 10 - (\pounds 2.15 + \pounds 2.30)$
M1 $\pounds 2.15 + \pounds 2.30$
A1 for 4.45
M1 $\pounds 10 - "4.45"$
A1 cao

(b) 21 2

$\pounds 60 \div \pounds 2.80 = 21.42857$
M1 for $\pounds 60 \div \pounds 2.80$ or sight of digits 214...
A1 for 21

(c) 30 2

$$120 \times 25 \div 100$$

M1 1/4 of £120 (oe)

A1 cao

SC B2 for £90

[8]

12. (a) (i) 0.25 2

B1 0.25

(ii) $\frac{1}{4}$

B1 cao

(b) (i) 2 2

B1 cao

(ii) 6

B1 cao

[4]

13. (a) 55(%) 1

B1 cao

(b) 0.09 1

B1 cao

(c) $\frac{9 \div 100 \times 400}{36}$ 2

M1 for $9 \div 100 \times 400$ oe eg 4×9

A1 cao

[4]

14. (a) 16 55 – 17 00 is 5min
 17 00 – 19 45 is 2 45
 $120 + 45 + 5$
 170 3

*MI for an attempt to partition,
 eg sight of 5, 2 45, 10, –10, 50, 165 or 60, 60, 45*

*AI for 60 + 60 + 50, 2h50(min),
 5 and 2h45(min) or 3h and –10
 2 –50, 2.50, 2 50 (not 250 or 2.5)*

AI cao

- (b) (i) 80 4
BI cao

- (ii) $800 \div 8 = 100$
 $3 \times 100 = 300$
 300
*MI for 800 ÷ 8 or 800 × 3
 or 100 seen or 2400 seen
 AI cao*

- (iii) $800 - ("80" + "300")$
 420
BI ft

- (c) $\frac{320}{800} \times 100$
 40 2

MI for $\frac{320}{800}$ (oe)

AI cao

[9]

15. (a) (i) 0.1 1
BI cao

- (ii) 10% 1
BI cao

- (b) 12 squares shaded 1
BI for any 12 squares shaded

[3]

16. (a) $5 + 10 \times 4.50$ 2
 50
MI for 10×4.50 or 45 seen
AI for 50

- (b) $65 - 65 \div 5$ 2
 52
MI for $65 \div 5$ oe or 13 seen
AI for 52

[4]

17. (a) Carbon black 1
BI accept 'black carbon' accept 26%

- (b) 0.1(0) 1
BI cao

- (c) 0.04 1
BI cao

- (d) $\frac{26}{100}$ 2
 $\frac{13}{50}$
MI for $\frac{26}{100}$
AI cao

[5]

18. (a) $\frac{7}{10}$ 1
B1 7/10 oe
- (b) (i) 4 squares
(ii) 80% 2
B1 4 squares shaded
B1 80% or ft from unshaded part
(no ft from 0% or 100%)
- (c) (i) 2.5
(ii) 1.7 2
B1 2.4 – 2.6 inclusive
B1 1.6 – 1.8 inclusive

[5]

19. (a) 6 shaded 1
B1 cao
- (b) 2 shaded 1
B1 cao
- (c) $\frac{3}{10}$ 1
B1 oe
- (d) 70% 1
B1 cao
- (e) $36 \div 4 \times 3 = 27$ 2

M1 for $36 \div 4$ or 36×3 or sight of 9 or 108
A1 for 27 cao

[6]

20. (a) 0.92 1
B1 for 0.92 cao
- (b) $\frac{3}{100}$ 1
B1 for $\frac{3}{100}$ cao
- (c) $\frac{5}{100} \times 400$
 20 2
M1 for $\frac{5}{100} \times 400$ oe
A1 for 20 cao

[4]

21. (a) 9 1
B1 cao
- (b) 64 1
B1 cao
- (c) $\frac{4}{5}$ 2
B2 for 4/5
(B1 for 80/100 oe or 0.8)
- (d) £32 2
M1 for $10/100 \times 320$, or $320 \div 10$
A1 cao
NB: £320-£32=£288 or £320+£32=£352 can be awarded M1
A1, but £288 or £352 without working award B1
- (e) 0.35, 3/8
 2/5, 45% 2
B2 all correct, or for equivalents in order: 0.35,0.375,0.4,0.45,
or for a mixture of equivalents as long as the order is correct.
(B1 one error of misplacing numbers, or correct conversion to
decimals or %, or correct order but reversed).
NB: accept 0.38 or 0.37 instead of 0.375 for B1, but not B2

[8]

22. (a) 35% 1
BI cao (accept 35)
- (b) 8 1
BI cao
- (c) $\frac{30}{100}$
 $\frac{3}{10}$ 2
MI for $\frac{30}{100}$ or $\frac{15}{50}$ or $\frac{6}{20}$ or 0.3(0) seen
AI cao
- (d) 0.09 1
BI cao
- (e) $\frac{14}{100} \times 2000$
 280 2
MI for $\frac{14}{100} \times 2000$ oe
AI cao
NB: 280% gets MI A0
- (f) $\frac{40}{2000} \times 100$
 2 2
MI for $\frac{40}{2000} \times 100$ oe
AI cao

[9]

23. $\frac{28}{100} \times 85000$
23800

2

MI for $\frac{28}{100} \times 85000$ oe

OR a complete method, allow one arithmetic error
AI cao

[2]

24. (a) 30

1

B1 for 30

(b) 5

1

B1 for 5

[2]

25. (a) $\frac{90}{600}$
 $\frac{3}{20}$

2

MI $\frac{90}{600}$

AI $\frac{3}{20}$ cao

[SC: B1 for 0.15 or 15% if M0 scored]

(b) $\frac{180}{600} \times 100$

MI $\frac{180}{600} \times 100$

AI cao

OR

$\frac{180}{600} = \frac{30}{100}$
30

2

MI $\frac{180}{600} = \frac{30}{100}$ or attempt to cancel to 100

AI cao

(c) $600 - (90 + 180) = 330$ blue or green
 $330 \div 3$
 110 2

*M1 ["600 - (90 + 180)"] \div 3
 A1 cao
 [SC: B1 for an answer of 140 or 170 if M0 scored]*

[6]

26. (a) 111 2

$$185 \times \frac{3}{5}$$

*M1 for multiplying 185 by 3 AND dividing by 5
 A1*

(b) £1.14 2

$$9.50 \times \frac{12}{100}$$

*M1 for multiplying 9.50 by 12 AND dividing by 100
 A1 cao*

[4]

27. (a) 1.6 1

B1 cao

(b) 35%, 0.4, $\frac{3}{7}$, $\frac{7}{15}$ 2

0.4 0.466 0.35 0.429

*B2 for all correct positions
 (B1 for one incorrectly placed)
 [SC: B1 for correct reverse order]*

[3]

28. (a) 45 4
BI cao
- (b) 75
BI cao
- (c) $\frac{3}{10}$
 $\frac{30}{100}$
M1 for $30 \div 100$ OR equivalent fraction
A1 cao
 [SC: $3 \div 10 = M1, A0$]
- [4]**
29. (a) 20 1
BI
- (b) 70 1
BI
- [2]**
30. (a) 25 1
BI
- (b) 23 1
BI
- (c) $\frac{21}{50}$ 2
M1 for $\frac{42}{100}$
A1 cao
- [4]**
31. $\frac{8}{10}$ and $66\frac{2}{3}\%$ 2
B2 for $\frac{8}{10}$ and $66\frac{2}{3}$ (B1 for 1 correct).
(-1 for each additional selection up to a max of -2)
- [2]**

32. (a) 38
BI 1
- (b) 30
BI 1
- [2]**
33. 360 2
- $$\frac{45 \times 800}{100}$$
- M1 for $45 \times 800 \div 100$ oe*
A1 for 360
- [2]**
34. 72 2
- $$36 \div 50 \times 100$$
- M1 for $36/50 \times 100$ oe*
A1 cao
- [2]**
35. 7800 3
- $$\frac{10}{100} \times 12000 = 1200$$
- $$12000 \div 4 = 3000$$
- $$12000 - 4200$$
- M1 for valid method to reach 1200 or 3000*
(or 1200 or 3000 seen)
M1 for complete method to reach "7800"
A1 cao
- [3]**
36. (a) 20
BI 1
- (b) 64
BI 1
- (c) 0.7
BI (accept 0.70) 1
- [3]**

37. 24960 3

$0.04 \times 24000 = 960$
 $24000 + 960$

M1 for $(4 \div 100) \times 24000$ oe or 960 seen
M1 (dep) for $24000 + "960"$
[Alt M2 for 24000×1.04]
A1 cao
[SC B2 for 23040]

[3]

38. (a) 37 1
B1

(b) 25 1
B1

(c) $\frac{19}{100}$ 1
B1

(d) $\frac{2}{7}$ 2

M1 for $\frac{40}{140}$ oe

[5]

39. (a) $\frac{2}{5}$ 2
 $\frac{40}{100}$
B2 for $\frac{2}{5}$
(B1 for $\frac{40}{100}$ or $\frac{4}{10}$ or $\frac{20}{50}$ or $\frac{8}{20}$ or $\frac{10}{25}$)

(b) 7 500 000 1
B1

(c) 60 1
B1

[4]

40. (a) 21 2

$$60 \div 28 = 21.42857$$

M1 for $60 \div 2.8$ oe (or 21.4 ... or 22 seen)

A1 cao

(b) 32 3

$$\frac{20}{100} \times 40 = 8$$

$$40 - 8$$

M1 for $20 \div 100 \times 40$ oe

A1 cao for 8 cao

A1 ft (dep on M1) for $40 - "8"$ evaluated correctly

[5]

41. $\frac{70}{100} \times 340 = 7 \times 34$ 2
238

M1 for $\frac{70}{100} \times 340$ oe

A1 cao

[2]

42. (a) 85 1
BI

(b) 10 1
BI

(c) 0.6(0) 1
BI

[3]

43. $\frac{20}{100} \times 5 = 1$
 $5 + 1 = 6$
 £6 3
- M1 for $\frac{20}{100} \times 5$ oe*
A1 for £1 profit
A1 ft for correct answer to £5 + "£1"
- [3]**
-
44. 0.333..., 0.375, 0.3, 0.35
 $0.3, \frac{1}{3}, 35\%, \frac{3}{8}$ 2
- B2 correct order*
(B1 just one out of place, or correct reverse order)
- [2]**
-
45. (a) (i) 25 2
B1 cao
- (ii) 80
B1 cao
- (b) 0.76 1
B1cao
- (c) $\frac{45}{100}$
 $\frac{9}{20}$ 2
- M1 for $\frac{45}{100}$*
A1 cao
- [5]**

46. (a) $\frac{37}{100}$ 1

B1 cao

(b) $\frac{37}{100} \times 415$ 2
 $= \pounds 153.55$

M1 for $\frac{37}{100} \times 415$ or

for attempt at build up method for $3 \times 10\% + 5\% + 2\%$

A1 cao

[3]

47. (a) 15 1

B1 cao

(b) $\frac{35}{100} = \frac{7}{20}$ 2

B2 for $\frac{7}{20}$ (B1 for $\frac{35}{100}$ seen)

[3]

48. $\frac{35}{100} \times 400$ 2
 $= 140$

M1 for $\frac{35}{100} \times 400$ oe

A1 cao

Alternative

“ $400 \div 10$ ” + “ $400 \div 10$ ” + “ $400 \div 10$ ” + “ $40 \div 2$ ” 2
 $= 140$

Alternative

M1 for “ $400 \div 10$ ” + “ $400 \div 10$ ” + “ $400 \div 10$ ” + “ $40 \div 2$ ” oe
A1 cao

Many candidates are using ‘build up’ or ‘decomposition’ methods in finding 35% of £400. To gain the mark this method must be complete and fully explained.

For example: 50% = £200 (this is correct so method implied)

10% = £50 (no explanation of method)

5% = £25 (this is ‘correct ft’ so method implied)

giving 35% = £175 gets M0A0

However $50\% = £200$

$10\% = £200 \div 5 = £50$ (*method clearly described*)

$5\% = £25$ giving $35\% = £175$ gets M1A0

In this case the candidate has explained how they found 10% by saying “ $£200 \div 5$ ”, so the method is correct, only errors in the accuracy.

A number of candidates are reading the question as 35% off £400 and are giving answers of £260.

This is clearly a misread, allowing the award of the method mark only.

So, if we have not already given M1 as per the mark scheme, M1 can be awarded for:

- an answer of £260 (with or without working)

- sight of $\frac{65}{100} \times 400$ oe (including complete build-up methods)

Ignore the inclusion of a % sign or units of money within their

written solutions. (eg. $\frac{35\%}{100} \times £400$ gets M1)

If the candidate is working in pence, an answer of 14000p must be seen with the £ sign deleted.

[2]

49. 17

B1 cao

1

[1]

50. (a) 24%

B1 cao

1

(b) 70%

B1 cao

1

(c) 25%

B1 cao

1

(d) 35

B1 for $\frac{3}{5}$ oe

1

(e) $7/200$ oe

M1 for 200 seen

A1 for $7/200$ oe

2

[6]

51. $100 - (23 + 32 + 10)$
 $= 100 - 65$
 35 2
- M1 for $100 - (23 + 32 + 10)$ o.e.*
A1 cao watch for answer only in table
- [2]**
-
52. (a) 0.25 1
B1 cao
- (b) 5 1
B1 cao
- [2]**
-
53. (a) 25 1
B1 for 25 cao
- (b) 0.2 1
B1 for 0.2 cao
- (c) $\frac{27}{100}$ 1
B1 for $\frac{27}{100}$ cao
- [3]**
-
54. (a) 0.9 1
B1 for 0.9
- (b) 75 1
B1 for 75 cao
- (c) $\frac{23}{100}$ 1
B1 for $\frac{23}{100}$ o.e.
- (d) 10 1
B1 for 10 cao
- [4]**

55. (i) $\frac{10}{100} \times 7200 = 720$ 2

*MI for $\frac{10}{100} \times 7200$ oe
AI (accept 720.00 or 720.0)*

(ii) $7200 - 720 = 6480$ 1
B1 ft from (i) for 7200 - '720'

[3]

1. Few candidates gave completely correct answers to this question. About 20% of candidates gained no marks, though the majority of candidates were able to answer one or two parts successfully.

In part (a) common incorrect answers given were ' $\frac{7}{10}$ ', and ' $\frac{1}{7}$ ', ' $\frac{7}{59}$ ',

In part (b) incorrect answers of '18' and '1.8' were often seen.

Part (c) however was correctly answered by about 25% of candidates.

2. Candidates had variable success with this question.
Part (a) was mostly well understood by all candidates.
Part (b) proved difficult for a lot of candidates with 3.4 or 0.34 often seen as incorrect answers.
Part (c) was usually correct in about 75% of cases whilst
Part (d) was completed fairly well by 90% of candidates.

3. Mathematics A

Paper 2

Many candidates found this multi-step question difficult. Lack of working limited the marks that most candidates scored. In part (a) 5 was often seen which scored 1 mark. In part (b) relatively few candidates scored any marks. Most found it difficult to find 5% of 269.30, of those candidates who did obtain the correct answer a significant number did not round the answer correctly and lost the final accuracy mark.

Paper 4

This was a well-answered question. In part (a) most candidates subtracted £56.80 and then divided the result by £42.50 to get 5 extra hours. A significant minority forgot to add on the first hour and so lost the second mark. Repeated addition was a common approach used by candidates who scored low marks overall on the paper. Part (b) was a good discriminator and the better candidates gained full marks. Those finding 95% of the total were usually successful although some gave the answer as £255.835 and lost the accuracy mark. Some took a more complicated route by first finding 5% of each hourly rate and often failed to gain the accuracy mark due to premature rounding or truncation of values. A number of non-calculator methods were seen (e. g. finding 5% by halving 10%) but this solution process was inappropriate on a calculator paper and candidates using such an approach usually made errors of approximation in their working.

Mathematics B

Paper 15

In Part (a) the value '6' frequently appeared with no evidence of working as did the value '5' where candidates had failed to add in the first hour's work. Others offered considerable working as they struggled to cope with the subtraction and then the multiplication (or repeated addition) of 42.5. The most common incorrect answers resulted from $269.3 \div 56.8$ or $269.3 \div 42.5$. In part (b) it was rare to see a fully correct amount. Quite a few candidates could get to 13.465 but left that as the answer. There was a large amount of incorrect attempts made to try to calculate 5% of £269.30

Paper 17

This question was very well done with many candidates gaining maximum marks. In part (a) the method shown in the mark scheme was the most common method employed, although many used repeated addition or subtraction, working out the cost hour by hour. Both methods were successful however an answer of 5 hours was often seen where candidates had failed to include the 1st hour. A minority used £56.80 as the hourly rate.

In part (b) the majority of candidates were able to work out 5% of a sum of money. The usual mistake occurring here was of premature approximation, which led to inaccurate answers. Quite a few candidates left their answer as £255.835 and lost the final accuracy mark.

4. Many candidates showed a correct method in part (a). Some started with ' $\frac{60}{100} \times 840$ ' but many found ' $10\% = 84$ ' and then multiplied by 6. An inability to carry out the calculation correctly, however, sometimes resulted in an incorrect final answer. Part (b) was answered quite well with many candidates finding 10% of 600 and then dividing 480 by 60. Part (c) was answered less well. It was common for candidates to find 40% of £272 and then add this to £272. Even some of those candidates who wrote ' $40\% = 272$ ' then went on to state that ' $10\% = 27.2$ '. Those who obtained the correct answer often did so by finding 80% and 20% and adding.
5. There was limited success on this question. In part (a) the correct method was often shown, but only a half of candidates could subtract correctly, -744 was a common wrong answer. In 88% of cases students managed to achieve 1 mark for obtaining one digit in the correct position. In part (b) the explain part of the question again proved difficult for students. Many misinterpreted the question and failed to show that 25% was 200 hence justifying their reasoning only about 40% of students obtained the correct answer. Parts (c and d), caused students the greatest difficulty. Lack of working limited the marks that students scored. In a small minority of cases students obtained an answer of 22 with no working. Most attempts that were seen used breaking down 800 into 50%, 25% etc. This incomplete method often led to answers in the range 15% - 25% but not to the correct answer. Only 7% of candidates obtained a fully correct solution.

6. Mathematics A Paper 3

This question was well attempted by many candidates. In part (a) some started with $\frac{45}{100} \times 800$ but many candidates broke the calculation down into 50% – 5% or 40% + 5%. Marks were sometimes lost because 5% was calculated incorrectly and no method shown. As would be expected, fewer candidates knew the method required for part (b) and some of those who wrote $\frac{176}{800} \times 100$ experienced difficulties evaluating it. Many did not realise that the calculation simplified to $176 \div 8$ and some of those who did divide 176 by 8 obtained an answer of 12 instead of 22. Candidates who tried to break down 800 (50% = 400, 25% = 200, etc) were almost always unsuccessful.

Mathematics B Paper 16

Two thirds of candidates successfully calculated 45% of 800, often using a build-up method. More candidates would have scored on this question if their method had been fully explained. For example; 50% = 400, 5% = 20 giving 45% = 380 gets no marks, whereas 50% = 400, 5% = $400/10 = 20$ giving 45% = $400 - 20 = 380$ gains a method mark since the calculation leading to the arithmetic error has been explained. $45 \times 8 = 320$ was seen on more than one occasion. Part (b) was not as well done, many candidates attempting to work out $176/100 \times 800$. Many tried this in two parts, initially working out $800/176$ and then getting stuck. Many candidates quoted $45/100 \times 800$ and $176/800 \times 100$ but were then unable to evaluate them.

7. This question was quite well done, with most candidates gaining most, if not full marks. There was little method shown. The $\frac{2}{3}$ presented most problems, and was seen to be misplaced in (a) and/or (b). This appears to suggest that candidates were converting fractions to decimals on their calculators, and perhaps rounding off in the process, though in few cases was any working shown.
8. Many candidates were unable to work out what calculations were required and only a quarter found the correct total charge. Having calculated 2% of 60000 some candidates then went on to find 1% of 80000 and others subtracted the result from 60000 and found 1% of the remainder. Some tried to find 3% of 80000. A significant number of candidates showed little understanding of place value and it was not uncommon for 1% of 60000 to be given as 6 or 60 or 6000.
9. This was a well answered question. Nearly $\frac{3}{4}$ of all candidates knew how to convert the £ 475 into Euros, the most common error being an attempt to divide rather than multiply. A greater proportion of the candidates gained full marks, giving the correct answer. The only common confusion was by those candidates who felt the need to divide by the 16, rather than multiply. It was disappointing to see a significant minority trying to use a partitioning method to break the percentage down into 10%, 5%, and 1%, but all such methods led to inaccuracy and error.
10. Few candidates failed to score on this question. If one or two marks were gained, it was usually on parts (a) and (e), although fractions which were not in their simplest forms, such as $\frac{40}{100}$ and $\frac{40}{10}$, were not uncommon in part (a). Such answers gained 1 mark out of 2.
11. (a) 75% of candidates gained full marks for this question, mostly without showing any working. Candidates not using the correct prices caused the most common errors. If no working was shown it was a pity that part marks could not be awarded.
(b) 53% of the answers to this part of the question were correct. A good proportion of candidates used a trial and improvement method rather than division. Some candidates multiplied the two numbers 20 and 2.60 whilst others did not give a whole number answer.
(c) 56% of candidates answered this part correctly. £95 was a common incorrect response – presumably some candidates had taken £25 off £120. Allowance was made for candidates who took £30 from £120 and wrote down £90 as their answer.

12. Around half the candidates were successful on each part of this question. Students should be encouraged to put 0.25 rather than .25 in (a)(i) as it was often not clear if a decimal point had been written or not. Nearly all the incorrect answers to (a) were given as 2.5.

In part (a)(ii) many just wrote $\frac{1}{4}$, which scored the mark. The most common incorrect response was $\frac{2}{5}$ with others only writing $\frac{25}{100}$ which scored no marks.

In part (b) there were a variety of incorrect responses to both parts, with no particular incorrect response standing out.

13. It was disappointing to find that less than half the candidates were able to complete the table, with 45% being a common incorrect response. Nearly $\frac{3}{4}$ of the candidates had no idea how to write 9% as a decimal, writing all sorts of answers that bore no relation to the question. 0.9 was a common incorrect response. In part (c) only around 15% of the candidates had any idea of how to use the information given, i.e. that 400 people took part in the survey. The most popular incorrect response was to write 9% on its own as the answer. Others wrote that $10\% = 40$ thus $9\% = 40 - 1 = 39$!

14. Foundation tier

A variety of methods were used to work out the number of minutes between 16 55 and 19 45. The most successful tended to go to the nearest hour and then add on, ie $5 + 60 + 60 + 45$. Around half the candidates failed to score despite the first mark being awarded for any attempt to partition, with the most popular incorrect response being 290 obtained by subtracting 1655 from 1945. Nearly half the candidates were able to work out a tenth of 800 correctly but many then went on to treble this answer to obtain the number of women on the train. Candidates are to be encouraged to read the question carefully. About a quarter of the candidates obtained the correct answer of 300. Around 40% of the candidates were able to score the final mark in part (b) by subtracting their answers to the first two parts from 800 with 100, 300, 400 being a common incorrect response. Candidates struggled with converting 320 out of 800 to a percentage, with nearly 90% of the candidates failing to score in this part of the question, even though one of the two marks was awarded for writing 320 out of 800 as a fraction.

Intermediate Tier

The majority of candidates gained full marks for part (a), but some missed the 5 minutes, leading to answers of 165 or 175. A significant minority of candidates tried a decimal subtraction method, but most candidates partitioned the time, frequently working up from 1655 to 1945. A lot of calculations were spoilt by some basic errors in arithmetic, and a general lack of care in organising their work. Again the majority of candidates gained full marks for part (b).

A significant number failed to read the question carefully, and having worked out $\frac{1}{10}$ of 800,

then moved on to work out $\frac{3}{10}$ of 800 rather than $\frac{3}{8}$ as the question demanded. Most gained the

mark in part (ii), since this was a follow-through mark. Those who failed to get the mark usually did so because they had failed to include the children in their calculation. In part (c) most candidates demonstrated they needed to work out $320 \div 800$, the most common error occurring when they attempted the inverse of this. Most then went on to give the correct answer, but many could not carry out the necessary calculation.

15. Candidates at this tier of entry often struggle with interchanging between fractions, decimals and percentages. This year has not been an exception. About 50% of candidates could change a tenth to a decimal, and 60% could change a tenth to a decimal, whilst only about 50% of candidates could shade in the 12 squares required.

16. Foundation Tier

Candidates understood this question but unfortunately not some of the maths they had to do to answer it. Part (a) was most successfully answered with 61% of responses correct. Part (b) that involved fractions and percentages (VAT) was less successful with 16% and 9% success respectively. In part (a) a mark was often lost where candidates failed to add on the initial £5.00, giving an answer of £45.00 instead of £50.00. In part (b) candidates said that one fifth of £65.00 was £5.00.

Intermediate Tier

Part (a) was answered extremely well. A few candidates calculated $10 \times £4.50$ but didn't add on £5. Almost 70% of candidates worked out the correct cost in part (b). Some worked out the discount as £13 but forgot to subtract it from £65 and $\frac{1}{5} = 5\%$ was also seen regularly.

17. Almost all candidates wrote the correct answer as Carbon black or 26% in part (a) and 10% was almost always correctly written as a decimal in part (b). However few candidates were able to deal with 4% as a fraction and the modal answer was 0.4 In part (d) about a third of candidates at this level made no attempt at the question. Of those that attempted the question about a half gave $\frac{26}{100}$ and probably a half of those gave a correct simplification to $\frac{13}{50}$. There were a significant number of candidates rounding 26% to 25% and giving $\frac{1}{4}$. Another very common response was $\frac{2}{6}$ and or $\frac{1}{3}$.
18. This question was well answered, with the possible exception of (b)(i) where the success rate was under 50%. Most candidates were able to give the fraction shaded as $\frac{7}{10}$ in part (a). However, five squares were often shaded in response to (b)(ii). Candidates who were unsuccessful in this part of the question often went on to give the correct answer of 80% in part (b)(ii). A follow through mark was also allowed here. Answers to part (c) were almost invariably within the range of values allowed and few candidates (%) lost marks here. Not surprisingly, slightly more candidates were successful in (c)(i) than in (c)(ii).
19. It was rare for candidates to score full marks on this question. In part (a) candidates often just shaded 3 parts out of 8 rather than $\frac{3}{4}$. The common answers for part (c) were $\frac{1}{3}$, $\frac{0}{3}$ or $\frac{3}{0}$ and for part (d) were 0.7, 7 or 0.70. Part (e) caused many problems. Some candidates gained a mark for 9 but many showed a lack of understanding and if any working was shown seemed more often to be dividing by 2 or 3.
20. Part (a) was answered with the most success with two thirds of candidates able to write 92% as 0.92. The most common incorrect answer was 9.2. It was disappointing that in part (b) fewer than half of the candidates could write 3% as $\frac{3}{100}$. The most common incorrect answers were $\frac{1}{3}$ and $\frac{3}{10}$. Part (c) was answered quite well and successful candidates often used the standard non-calculator method of finding 10% first. Some worked out $50\% = 200$ and $25\% = 100$ but then got stuck. Where the traditional method of $\frac{5}{100} \times 400$ was seen candidates usually struggled to proceed any further with the calculation. A common incorrect method was for 400 to be divided by 5. Unfortunately many candidates showed no method at all.

21. The success rate in parts (a) & (b) in this question was related to that of question 2(ii), about half the candidates gaining the mark, with many lacking an understanding of square numbers or indices. In part (c) most were able to express the fraction as $\frac{80}{100}$, but of these half were then unable to cancel the fraction into its simplest form.

Candidates used a variety of methods in part (d), with many realising that a division by 10, or “10p in the £” would lead to the correct answer.

Candidates found part (e) far more challenging. The most successful method appeared to be conversion to decimals.

22. There were mostly correct answers seen in parts (a) and (b).

In part (c) the majority of the candidates could access at least one of the marks by writing $\frac{30}{100}$

or $\frac{15}{30}$ or another equivalent fraction. It was disappointing to note how many wrote the correct answer of $\frac{3}{10}$ but then cancelled this further to get $\frac{1}{3}$, which meant they lost the final accuracy mark. Candidates should be encouraged to show their equivalent fractions along the way as many just wrote $\frac{1}{3}$ as their final answer, which meant they scored no marks.

In part (d) those who knew percentage meant “out of a hundred” were generally successful with just over $\frac{1}{2}$ the candidates getting this correct. The incorrect answers of 0.9 and even 9.0 were frequently seen.

Part (e) was quite well done although a surprising number clearly did not use a calculator for this computation. Nearly $\frac{1}{2}$ the candidates got this fully correct. Errors in breaking down 14% into 10%, 1% etc were either arithmetic or were not combined correctly. A significant number of candidates divided 2000 by 14 or used 200 rather than 2000. Candidates who knew the traditional method of $\frac{14}{100} \times 2000$ were largely successful.

Most candidates had difficulties with part (f). Some correct answers were obtained from $40 \div 2000 \times 100$ whilst other correct answers were found by a comparison of 10% of 2000 = 200 with 40 and scaling down accordingly. Some candidates simply stated the answer without any working. The most common incorrect attempts were to calculate 40% of 2000 or to subtract 40 from 2000.

23. This question had over 40% success rate. Relatively few were able to write $28 \div 100 \times 85000$ to access the method mark and then use the calculator to find the correct answer. Many tried to break the question down into parts but then went wrong at the first hurdle when attempting to find 10% of 85000, often writing this as 850 without any working. Those that did find 10% correctly often had difficulty in using this as a starting point to find 28%. Finding 5% was generally correct but the extra 3% proved a problem for many candidates.

24. Specification A

Candidates clearly understood that 50% is equal to one half and were able to correctly find a half of £60 in part (a). In part (b), whilst knowing that 25% is equal to one quarter, there were a significant number of arithmetic mistakes in dividing 20 by 4; an answer of 4 was a common error.

Specification B

Part (a) was done well by virtually all the candidates. Part (b) was done well by most candidates. Many realised that they needed to find a quarter of 20, but some were unable to do this accurately. Of the few candidates that showed any working in this question, a popular approach was to divide 20 by 2 and then divide their answer by 2 again.

25. In many cases in part (a), candidates gave a fraction of $\frac{90}{600}$ and then either failed to simplify it correctly or failed to complete the simplifying process.

Part (b) was quite poorly answered, many candidates misunderstanding the demand of the question and trying to find 180% of 600. Many tried partitioning methods and often statements like “10% = 60” were seen but solutions were unable to progress and no marks could be awarded.

In part (c), the most popular misconception was to divide 330 by 2 (instead of 3) and then to divide their answer by 2 again; 82.5 or similar being a common incorrect answer seen. Some candidates failed to take account of both the yellow and red counters already having been used, omitting usually just one of them, leading to an answer of 140 or 170. One mark was awarded in these cases.

26. (a) This was poorly answered by most candidates with very few obtaining any marks. The favourite response was to leave it blank.
(b) This was answered slightly better than part (a) but even so, few obtained any marks for this question.

27. Part (a) was usually done very well, although a small minority of candidates either doubled or squared 2.56 instead of finding the square root. Few failed to score at least 1 mark on part (b), the rest being evenly split between 1 and 2 marks. Decimal equivalents were not often seen; in fact most candidates showed no working at all.
28. This straightforward question caused a great deal of difficulty to most candidates with few scoring more than 2 marks from all three parts, generally one from obtaining the 45% and one from obtaining $\frac{30}{100}$ and then not cancelling.
29. Most candidates found this question demanding. There was little in the way of evidence as to how the percentage was calculated in part (a). Some resorted to arrangements of the digits 1 and 5 giving the answer of 15, 5, 10, 0.5 or 1.5. Part (b) was handled better with 70% often occurring. 7 and 0.7 were common incorrect answers.
30. Writing $\frac{1}{4}$ and 0.23 as a percentage did not cause much difficulty. However converting 42% to a fraction in its simplest form gave rise to a variety of responses. Many appreciated that $\frac{42}{100}$ was required and this was duly rewarded with a method mark. The cancelling down did not, however, always lead to the correct simple fraction with many ending up with a fraction within a fraction. Those with little idea how to approach this question often provided an answer of $\frac{4}{2}$ or $\frac{2}{4}$.
31. 77% of the candidature gained full marks here, and failure to achieve this usually meant that 1 mark was scored, $\frac{9}{12}$ and $\frac{6}{8}$ occasionally being incorrectly selected.
32. In part (a) writing 0.38 as a percentage was clearly understood by the majority of the candidates with very few incorrect responses seen. In part (b) many were able to correctly convert the given fraction to a percentage although '3' on its own put in an occasional appearance on the answer line.

33. Candidates did not always display confidence in handling the percentage calculation with only 12% of candidates scoring both marks. There were very few attempts at $45 \div 100 \times 800$. Attempts at finding 50% were let down by inaccurately working out the 5% so that they could subtract to get the 45%. Other calculations based upon finding 10% were frequently more successful.
34. It was pleasing to see a significant number of correct answers resulting from a recognition that multiplying by 2 gave the required percentage. Some did write $\frac{36}{50} \times 100$ and could go no further, but the most common error here was to find 36% of 50. Build-up methods often failed to score any marks usually through lack of explanation of method or poor arithmetic; a typical attempt seen was $10\% = 5$, $20\% = 10$, $40\% = 20$, $1\% = 1$, giving 36 as 71% of 50.
35. There were many different approaches in trying to achieve a solution but the success rate was limited (6% scoring all 3 available marks). Working out 10% of £12000 resulted in the correct answer of £1200 and incorrectly £1000 or £120. Calculating a quarter of £12000 was more successful, however many felt $\frac{1}{4}$ of £12000 was £4000. Either one of these indicating a valid method or arriving at the correct sum earned the first method mark. Dealing with the amounts after this proved rather more demanding. Many candidates would have benefited from the second method mark if they had structured their workings in a way that identified 'their' rent and clothes and shown £12000 – their answers. A common error was to subtract 10% from £12000 and then find a quarter of the remainder. A handful of candidates went down the $10\% + 25\% = 35\%$ route but this generally did not lead to the correct answer. There was much evidence of attempts at doing the various calculations but in some cases candidates became swamped in their own sea of figures. Had working been shown clearly, I feel that many of the 53% of candidates who scored no marks would have been able to access at least one or two of the available method marks.
36. The conversion of fractions, decimals and percentages to a required form was attempted by most candidates with varying degrees of success. Changing $\frac{1}{5}$ to a percentage for part (a) seemed the most troublesome with only 28% getting this correct. Making use of the digits '1' and '5' lead to conclusions that $\frac{1}{5}$ was '15%', '1.5%' or '5%' with the more obscure results of '75', '50', '35' and '30' being harder to appreciate in terms of explanations. Writing '0.64' as a percentage in part (b) was handled with confidence (77% correct responses) as was changing '70%' to a decimal for part (c) with 67% of the candidates getting this correct..

37. The most common error was in the finding of 4% of £24 000. Many candidates found 40% or 0.4% by failing to divide by 100 correctly or by simply dividing by 10 or 1000. Far too many candidates adopted a partitioning approach instead of making use of the calculator at their disposal, this was most disappointing as many needless arithmetic errors were made. Centres are advised to ensure that candidates know the correct method to use on calculator papers. A significant number of candidates found £960 (4% of 24 000) and then left this as their answer; thus losing two marks for failing to read the question carefully.
38. Writing 0.37 as a percentage proved to be a simple task for well over 80% of the candidates but only 60% of the candidates were able to successfully write $\frac{1}{4}$ as 25% and just over 30% were able to write 19% correctly as a fraction. In part (d) nearly half of the candidates were able to express 40 out of 140 as a fraction but most were then unable to cancel this down to its simplest form.
39. Candidates were mostly able to write 40% as a fraction but had more difficulty giving it in its simplest form. Writing $7\frac{1}{2}$ million in figures proved far more challenging with an assortment of responses many with multiple decimal points. It was disappointing to see how many incorrect responses there were to part (c) with many candidates writing '98%' as their answer.
40. For part (a) dividing £60 by £2.80 was wanted and then interpreting the result. Just over half the candidates were able to come up with 21 books scoring the full two marks. Part (b) was considerably less successful. Finding 20% of £40 proved to be quite challenging and various methods at achieving the result were in evidence. For those who arrived at an amount they often omitted to complete the calculation by subtracting from £40.
41. It is disappointing to report that only half of the candidature were able to find 70% of £340 accurately. Many used build up methods which were often not well defined and prone to arithmetic error. $50\% = £170$ was often followed by $10\% =$ anything but the correct amount. It was common for 50% to be followed by 25% and then $12\frac{1}{2}\%$ leading nowhere. A few candidates, on correctly finding 70% as £236, went on to subtract their answer from £340. Such a response was not penalised.
42. There were mostly correct conversions from a decimal to a percentage in part (a) and changing from a fraction to a percentage in part (b). Writing '60%' as a decimal in the final part appeared to be less confidently handled, although 70% of the candidates did get it correct, with various combinations involving the digits '0' and '6' along with a decimal point.

43. No report available.
44. No report available.
45. 60% of the candidates were able to correctly write $\frac{1}{4}$ as 25% however writing 0.8 as a percentage proved more difficult with nearly two thirds of the candidates not being able to provide the correct answer of 80%. The most common incorrect response was '8%'. The vast majority of the candidates realised that the answer required the digits 7 and 6 but only just over half realised that 76% was 0.76 when written as a decimal. Many felt that the answer should be 7.6. In part (c), by far the most common response was $\frac{4}{5}$ when attempting to write 45% as a fraction in its simplest form. Those who did get $\frac{45}{100}$ seemed only to possess the 'halving top and bottom' strategy and so could not progress to $\frac{9}{20}$. Most candidates 'had a go' with around 35% accessing the first mark. and 10% overall getting the correct final answer.
46. Only about half of the candidates were able to write 37% correctly as a fraction but even fewer were able to correctly calculate 37% of £415. About a quarter of candidates were fully successful with a further 5% gaining a part mark, usually for showing a build up method for 37%.
47. Candidates could, in the main, write 0.15 as a percentage with 1.5 being the most common incorrect answer. Writing 35% as a fraction was not as successful. Those that knew to put the number as a fraction with a denominator of 100 were then not able to cancel this fraction to its simplest form. A few did reach $\frac{7}{20}$ but then went on to cancel it further, generally to $\frac{3.5}{10}$ which meant they could not score both available marks. The mean mark for this 2 mark part of the question was 0.47

48. The most popular method in finding 35% of £400 was to use a “build up” or partitioning method. Although this method was often successful, it often failed as candidates rarely fully explain their methods.
25% = £100
10% = £40
5% = £20 followed by an answer of £160 was not uncommon.
Some candidates misinterpreted the word “of” and tried to find 35% taken “off” £400, giving an answer of £260 This gained one mark only. Weaker candidates offered £365 (400 – 35) as their answer.
49. This question proved to be accessible to most candidates with 86% writing the correct answer of 17%. The most common incorrect response was 27%, which indicates that many candidates did not use their calculators when answering this question.
50. In parts (a) and (b) most candidates had the right idea, that is to multiply by a power of ten, but this could also mean 10 or 1000, rather than 100, leading to 240 and 2.4 in some cases in (a), and just 7 (rather than 70) in (b). In (c) it was clear that candidates were attempting to recall knowledge of the percentage equivalent, and frequently got this wrong, giving 20%, 30%, 40% as the answer. In part (d) the desire to multiply 3 by 5 was too much for many candidates, resulting in 15 or more commonly $\frac{3}{15}$ on the answer line. Part (e) most candidates were able to write the figures as a fraction (eg $\frac{7}{2}$ or $\frac{2}{7}$) and many did do the conversion and write the correct answer.
51. This question too was well understood with 81% candidates obtaining fully correct solutions and a further 2% scoring 1 mark, usually for attempting to subtract their total for red, blue and green from 100.
52. Fractions often cause a lot of problems on a foundation paper but 50% of candidates were able to write $\frac{1}{4}$ as 0.25 and there was even more success with percentages where 71% of candidates were able to write 10% of £50 as £5.

- 53.** The first part of the first question on the paper was answered well with a success rate of over 80%. “26” was the most frequently seen incorrect response. Parts (b) and (c) provided more of a challenge. In part (b) only about one quarter of candidates could give a correct answer. The incorrect answer “0.15” was more commonly seen. In part (c) the fraction “ $\frac{2}{7}$ ” was seen almost as often as the correct answer “ $\frac{27}{100}$ ”. Here, just over a half of candidates were awarded the mark available.
- 54.** Conversions involving fractions, decimals and percentages were not as well handled as would be expected for the opening question with around two-thirds of the candidates having success on each part except for part (c) which only had a 57% success rate. Practice might have eliminated some misunderstandings of the type ‘ $\frac{9}{10} = 9.10$ ’, ‘ $\frac{3}{4} = 34\%$ ’ and ‘ $23\% = \frac{2}{3}$ ’.
- 55.** Working out 10% of £7200 in part (a) led to £720 in many cases. However, it is important to stress the importance of reading the question carefully as it was not unusual to see the amount given as £6480 as the answer to part (a) ... this being the answer to the second part of the question. £72 as the answer also appeared representing 1% of the sum rather than the required 10%. A follow through in part (b) allowed for an earlier error in the calculation not to be penalised twice. Just under 20% failed to score on this question and around 50% scored all 3 marks. Many candidates wrote the same answer in both parts, generally £720 or £6480