1. The table shows charges made by a gas company to its customers.

Cost per day PLUS Cost per unit of gas used	23p 7p

The owner of a flat receives a gas bill covering a period of 100 days.
They have used 7000 units of gas in this period.

Show that their bill is for £513.

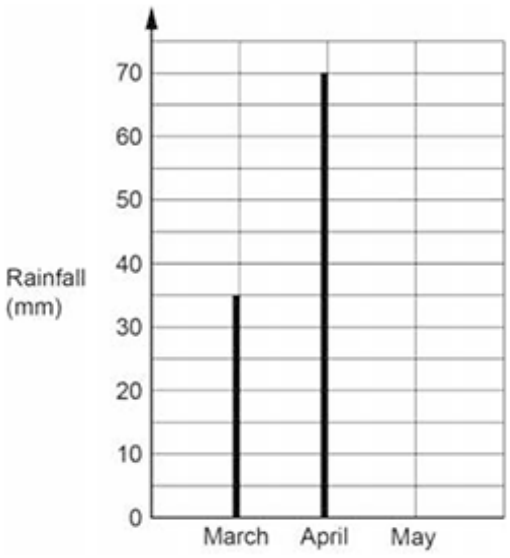
[4]

2. Layla is thinking of a fraction.
The numerator is a cube number less than 100.
The denominator is a square number less than 100.
The fraction is equivalent to $\frac{1}{3}$.

Find the fraction that Layla is thinking of.

.....**[3]**

3. The vertical line chart shows the rainfall, in millimetres (mm), in March and April.



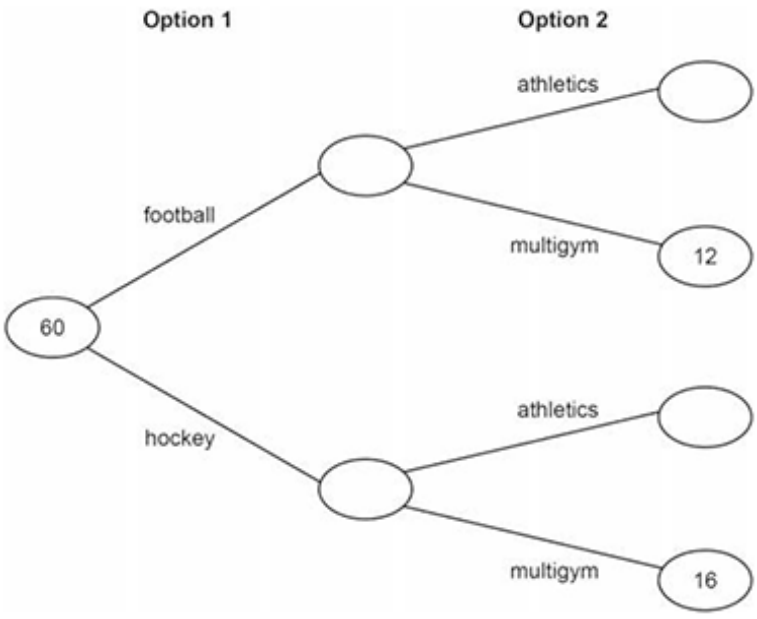
Given there was 65mm of rainfall in May, work out the **total** rainfall for March, April and May.

..... mm **[2]**

4. 60 students each chose two activities, one from Option 1 and one from Option 2.

Option	Activity
1	football or hockey
2	athletics or multigym

This frequency tree shows the number of students choosing some of the activities.



Ten more students chose football rather than hockey.

Complete the frequency tree.

[4]

5(a). (a) Write down a multiple of 7 between 30 and 40.

.....**[1]**

(b). (b) Write down a factor of 66 between 11 and 30.

.....**[1]**

6(a). Work out.

9 + −6

.....**[1]**

(b). 51 × 4

.....**[1]**

7.

Write down all the factors of 21.

..... **[2]**

8. Work out.

2849 ÷ 7

.....**[1]**

9.

Find the largest number that will divide exactly into 21 and 84.

..... **[1]**

10. Li thinks of a number.

Li says,

When I square root my number and divide the result by 10 the answer is 1.4.

Find Li's number.

..... **[2]**

11. Insert **two** of these symbols +, −, × or ÷ to make this calculation correct.

6.....(3.....1) = 12

[1]

12.

i. Write down an even number.

..... **[1]**

ii. Write down a common multiple of 7 and 12.

..... **[1]**

13. Calculate

$$\sqrt{\frac{14.2^3 - 92}{6^2}}$$

Give your answer correct to **3** significant figures.

..... **[3]**

14(a). The table shows how much Ivan earns per hour.

Work done on Monday to Friday	£20.23 per hour
Work done on Saturday or Sunday	£30.18 per hour

One week Ivan works for $30\frac{1}{4}$ hours between Monday and Friday and then for $5\frac{1}{3}$ hours on Saturday.

Ivan says

I will earn at least £700 for my work this week.

By rounding each value to the nearest integer, use estimation to show that Ivan may be correct.

[5]

(b). Give **one** reason why your working in part **(a)** shows that Ivan can be **certain** of earning at least £700 for his work in this week.

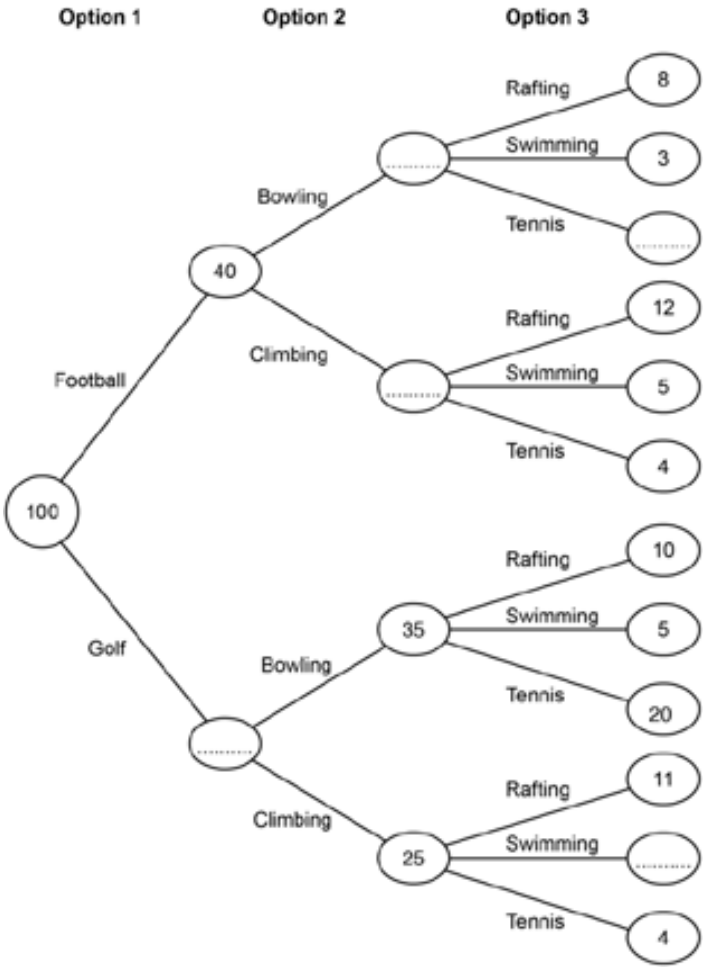
---**[1]**

15(a). At an adventure park, all children participate in three activities, choosing exactly one activity from each of three options.

Option	Activity
1	football or golf
2	bowling or climbing
3	rafting or swimming or tennis

On one Monday morning, 100 children visited the adventure park.

The frequency tree shows the number of children choosing some of the activities.



Complete the frequency tree.

[3]

(b). Which was the most popular activity out of rafting, swimming and tennis?
Show how you decide.

because

---

[3]

(c). One of the 100 children is picked at random.

Find the probability that this child chose climbing.

..... **[2]**

(d). Jane says

60% of all children coming to the adventure park choose golf.

What assumption has Jane made?

---**[1]**

16. Gabi and Finley both have the same number of newspapers to deliver.

By 8am

- Gabi has delivered 36% of her newspapers
- Finley has delivered $\frac{3}{8}$ of his newspapers.

Work out the smallest possible number of newspapers that Gabi must deliver.

..... **[2]**

17. Complete this statement to make it correct.
Give your answer as a number in ordinary form.

$\sqrt[3]{} = 11$

[2]

18(a). Compost is used to grow plants.
Jane has a sack containing 60 litres of compost.
She uses this compost to fill pots for her plants.

Jane fills ten large pots each holding 5.5 litres.

Work out how much compost is left in the sack.

..... litres **[2]**

(b). Jane uses the remaining compost to fill small pots each holding 800 ml.

Work out the maximum number of small pots Jane can fill with the remaining compost.

..... **[3]**

(c). Work out how much compost will then be left in the sack.

..... ml **[2]**

19(a). Work out.

-56 ÷ 8

..... **[1]**

(b). $(^{-}6)^2$

..... **[1]**

(c). -9 − 5

..... **[1]**

20. A teacher writes down a number.
They add 7 to the number and then divide by 9.
Their answer is 52.

What number did the teacher write down?

..... **[2]**

21(a). Write down an example of the following.

An odd number.

..... **[1]**

(b). A multiple of 9.

..... **[1]**

(c). A cube number between 70 and 200.

..... **[1]**

(d). A prime number greater than 3.

..... **[1]**

22(a). Write down a multiple of 9 between 30 and 40.

..... **[1]**

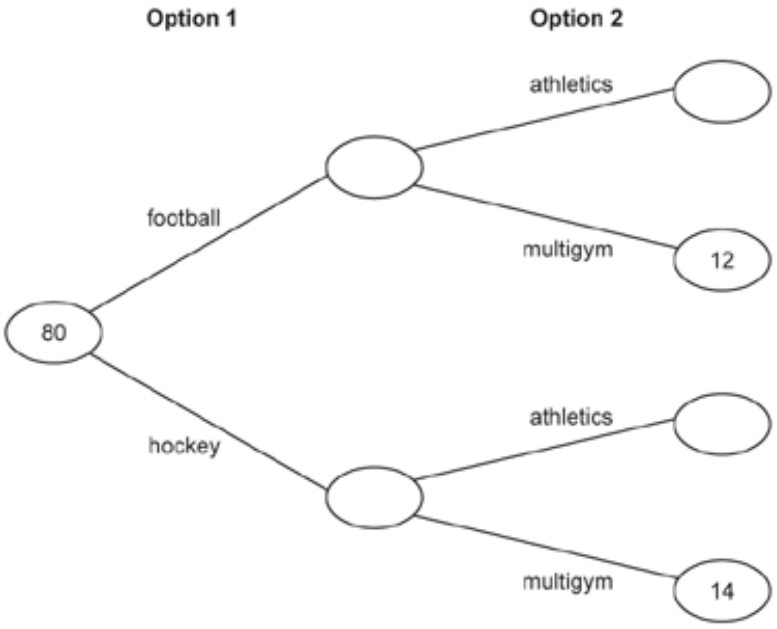
(b). Write down a factor of 100 between 11 and 30.

..... **[1]**

23. 80 students each chose two activities, one from Option 1 and one from Option 2.

Option	Activity
1	football or hockey
2	athletics or multigym

This frequency tree shows the number of students choosing some of the activities.



Ten more students chose football rather than hockey.

Complete the frequency tree.

[4]

24. The table shows charges made by a gas company to its customers.

Cost per day	27p
PLUS	
Cost per unit of gas used	8p

The owner of a flat receives a gas bill covering a period of 100 days.
They have used 7000 units of gas in this period.

Show that their bill is for £587.

[4]

25. Rosa is thinking of a fraction.
The numerator is a cube number less than 100.
The denominator is a square number less than 100.
The fraction is equivalent to $\frac{1}{8}$

Find the fraction that Rosa is thinking of.

.....**[3]**

26(a). Work out.

7 + –5

..... **[1]**

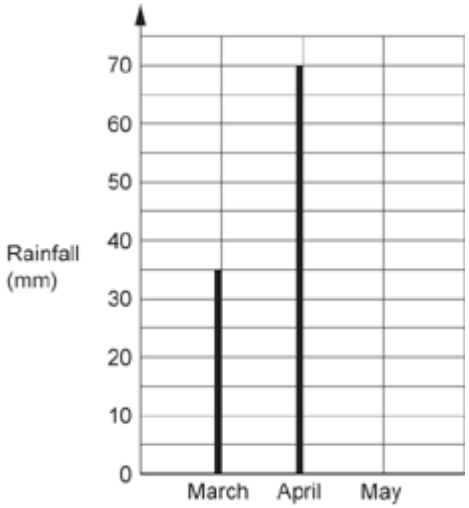
(b). 26 × 6

..... **[1]**

(c). 1648 ÷ 8

..... **[1]**

27. The vertical line chart shows the rainfall, in millimetres (mm), in March and April.



Given there was 55mm of rainfall in May, work out the **total** rainfall for March, April and May.

.....mm **[2]**

28(a). Write down all the factors of 15.

..... **[2]**

(b). Find the largest number that will divide exactly into 15 and 60.

..... **[1]**

29. Ben thinks of a number.

Ben says,

When I square root my number and divide the result by 10 the answer is 1.3.

Find Ben's number.

..... **[2]**

30(a). Insert **two** of these symbols +, −, × or ÷ to make this calculation correct.

5.....(3 ..... 1) = 20

[1]

(b). Calculate

$$\sqrt{\frac{12.9^2 + 83}{5^2}}$$

Give your answer correct to **3** significant figures.

..... **[3]**

31.

i. Write down an odd number.

..... **[1]**

ii. Write down a common multiple of 3 and 17.

..... **[1]**

32. Insert one pair of brackets into each calculation to make it correct.

$$14 - 6 \div 2 = 4$$

$$5 \times 2 + 3 \times 2 = 40$$

[2]

33(a). In the number 43 852, the digit 8 represents eight hundred.

Write in words what the digit 3 represents.

..... **[1]**

(b). Write five million in figures.

..... **[1]**

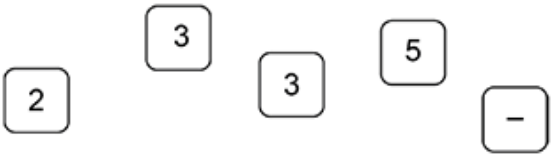
34(a). What type of numbers are 1, 8 and 27?

Circle **one** answer from the list.

cube numbers even numbers odd numbers prime numbers square numbers

[1]

(b). These are five tiles.



i. Arrange the five tiles to make a calculation with the answer 8.

..... **[1]**

ii. Write down a multiple of 7 that can be made using two of the five tiles.

..... **[1]**

35. A family buys a television for £499.
They pay a deposit of £79.
They then pay the rest of the cost in 12 equal payments.

How much is each payment?

£ ..... **[2]**

36. Complete each statement.

……. × 3 = 15.09

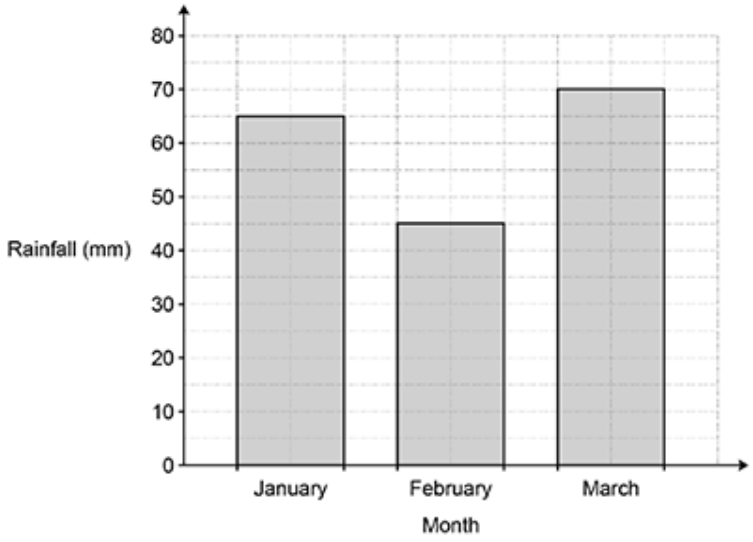
[2]

37. Work out.

38 × 100

…….…….…….. **[1]**

38. The bar chart shows the rainfall, in millimetres (mm), for a town in the first three months of the year.



The total amount of rainfall in January and February was the same as the total amount of rainfall in March and April.

Work out the amount of rainfall in April.

..... mm **[3]**

39. Complete the three missing values on this multiplication grid.

×	-3	8
-5	15	
		-32

[3]

40(a). Write down the **three** factors of 49.

……, ……, and …… **[2]**

(b). Write down a square number between 50 and 90.

…….…….…… **[1]**

41. The costs to hire a campervan are shown below.

Campervan hire	
First day	£110
Each extra day	£80
Each mile travelled	70p

Riley hired a campervan and travelled 480 miles.
The total cost of hiring the campervan was £766.

Calculate how many days Riley hired the campervan for.
You must show your working.

…….…….…… days **[5]**

42. A skater is in a competition.

Here are their scores after two events.

Event	Score	
1	16	out of 26 points
2	28	out of 40 points
3		out of 54 points

Event 3 is out of 54 points.

The skater's overall score is found by adding the three scores together.

Find the score the skater needs in event 3 to achieve 65% of the total points.

…….…….…….. **[4]**

43. Jane and Kofi both have the same number of newspapers to deliver.

By 8 am

- Jane has delivered 64% of her newspapers
- Kofi has delivered $\frac{5}{8}$ of his newspapers.

Work out the smallest possible number of newspapers that Jane must deliver.

..... **[2]**

44. Complete this statement to make it correct.
Give your answer as a number in ordinary form.

$\sqrt[3]{\ldots\ldots\ldots\ldots} = 12$

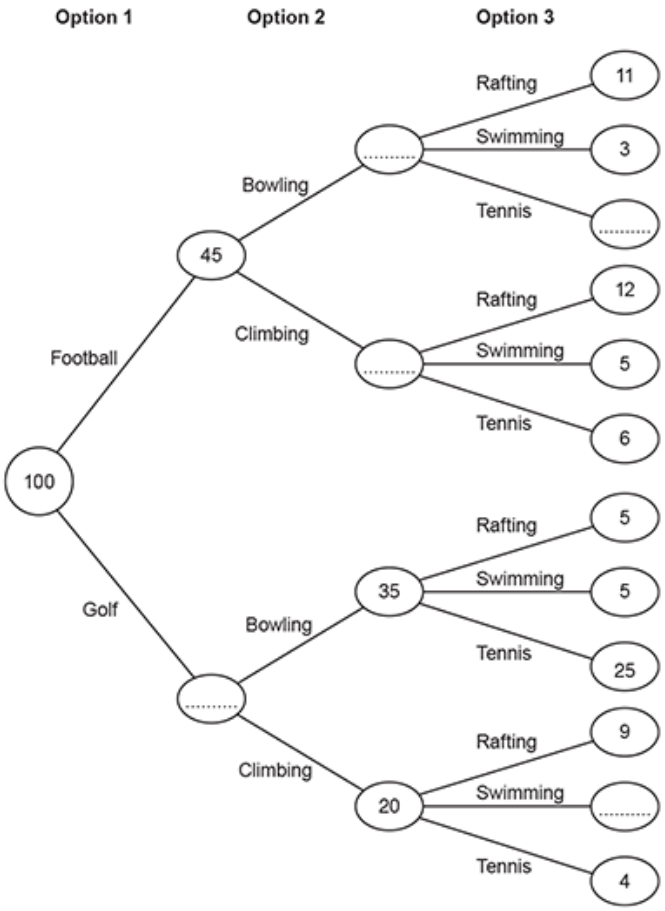
[2]

45(a). At an adventure park, all children participate in three activities, choosing exactly one activity from each of three options.

Option	Activity
1	football or golf
2	bowling or climbing
3	rafting or swimming or tennis

On one Monday morning, 100 children visited the adventure park.

The frequency tree shows the number of children choosing some of the activities.



Complete the frequency tree.

[3]

(b). Which was the most popular activity out of rafting, swimming and tennis?
Show how you decide.

_____ because _____

_____

_____ **[3]**

(c). One of the 100 children is picked at random.

Find the probability that this child chose bowling.

..... **[2]**

(d). Alex says

45% of all children coming to the adventure park choose football.

What assumption has Alex made?

_____

_____**[1]**

46(a). Compost is used to grow plants.
Ivan has a sack containing 50 litres of compost.
He uses this compost to fill pots for his plants.

Ivan fills six large pots each holding 7.5 litres.

Work out how much compost is left in the sack.

..... litres **[2]**

(b). Ivan uses the remaining compost to fill small pots each holding 400 ml.

Work out the maximum number of small pots Ivan can fill with the remaining compost.

..... **[3]**

(c). Work out how much compost will then be left in the sack.

..... ml **[2]**

47(a). The table shows how much Amaya earns per hour.

Work done on Monday to Friday	£20.15 per hour
Work done on Saturday or Sunday	£30.23 per hour

One week Amaya works for $40\frac{1}{3}$ hours between Monday and Friday and then for $4\frac{1}{4}$ hours on Saturday.

Amaya says

I will earn at least £900 for my work this week.

By rounding each value to the nearest integer, use estimation to show that Amaya may be correct.

[5]

(b). Give **one** reason why your working in part **(a)** shows that Amaya can be **certain** of earning at least £900 for her work in this week.

---------- **[1]**

48(a). Work out.

$^{-}7 - 4$

..... **[1]**

(b). $^{-}42 \div 6$

..... **[1]**

(c). $(^{-}4)^2$

..... **[1]**

49. Write down an example of a prime number less than 10.

..... **[1]**

50. A teacher writes down a number.
They subtract 6 from the number and then divide by 8.
Their answer is 81.

What number did the teacher write down?

..... **[2]**

51(a). Write down an example of an even number.

..... **[1]**

(b). Write down an example of a multiple of 7.

..... **[1]**

(c). Write down an example of a cube number between 20 and 220.

..... **[1]**

52. 147 and 245 are written as the product of their prime factors.

$147 = 3 \times 7^2$ $245 = 5 \times 7^2$

Work out the highest common factor (HCF) of 147 and 245.

..... **[2]**

53. Two supermarkets, A and B, have special offers on the same packet of biscuits.

Supermarket A

Normal price:
£1.60 for each packet

Special offer:
Buy two packets at the normal price and get a third packet for half price

Supermarket B

Normal price:
£1.70 for each packet

Special offer:
10% off the normal price

Ling buys **three** packets of these biscuits.

Which supermarket is best value for Ling?
Show how you decide.

Supermarket _____ because _____

[3]

54. An integer between 100 and 110 is written as the product of its prime factors as $2 \times 3 \times f$.

Find the value of f and the integer.

f = ……..…….……..

Integer = ……..…….…… **[3]**

55(a). Insert brackets to make this calculation correct.

$$3 \times 3 - 3 = 0$$

[1]

(b). Insert **two** of these symbols +, −, × or ÷ to make this calculation correct.

$$24 \ldots. 6(5 \ldots. 1) = 0$$

[1]

56. Jamal has £8 to spend on vegetables.
The table shows the prices.

Cauliflower (each)	£1.30
Potatoes (for 1 kilogram)	85p
Mushrooms (for a 400 g pack)	£1.20

Jamal buys 3 cauliflowers and 2 kilograms of potatoes.
Jamal spends the remaining money on mushrooms.

Work out the **mass, in grams**, of mushrooms that Jamal buys.
You must show your working.

..... g **[6]**

57. Write 54 as a product of prime factors.

..... **[2]**

58(a). Write a number in the box to make the statement true.

$\square - 8 = -10$

[1]

(b). $\frac{7}{\square} \div 2 = \frac{7}{16}$

[1]

(c). $\frac{\square}{\square} \times \frac{3}{4} = \frac{5}{8}$

[1]

59(a). Write down each of the following.

i. An odd number between 12 and 18.

..... **[1]**

ii. A square number between 30 and 50.

..... **[1]**

iii. The cube root of 27.

..... **[1]**

(b). 5 is a factor of 65.

Find a factor of 65 between 10 and 20.

…….…….…….. **[1]**

60(a).

$2a = \sqrt{b}$ where *b* is a positive integer from 24 to 37.

Given that *a* is a positive integer, find its value.
You must show your working.

a = ……..…….…….. **[2]**

(b). How would your answer to **part (a)** change if *a* was only described as an integer?

_____**[1]**

61. The factors of 12 are 1, 2, 3, 4, 6 and 12.
The factors of 18 are 1, 3, 6, 9 and 18.

Write down the highest common factor (HCF) of 12 and 18.

……..…….…….. **[1]**

62(a). Complete this prime factorisation of 150.
You may not need to use all of the answer lines.

150 = 2 × 3 × .....

.....

.....

[1]

(b). A teacher says that the cube root of their favourite number is 4.

Write down the teacher's favourite number.

…….. **[1]**

63(a). A recipe for biscuits says

Multiply the number of biscuits by 6.25 to find the number of grams of butter needed.

Charlie uses 150 g of butter.

How many biscuits does Charlie make?

…….. **[2]**

(b). The estimated cost of driving

- an electric car is 69 pence per mile
- a petrol car is 81 pence per mile.

Finley expects to drive 11 000 miles next year.

Use this information to work out how much money Finley can expect to save next year if driving an electric car instead of a petrol car.

£ …….. **[3]**

64(a). Work out.

$30 - 18 \div 2$

…….. **[1]**

(b). Insert one pair of brackets to make this calculation correct.

$7 + 6 - 2 \times 5 = 27$

[1]

65. Trams to the airport leave every 40 minutes.
Trams to the beach leave every 25 minutes.
A tram to the airport and a tram to the beach leave together at 10:50 am.

When is the next time that two of these trams leave together?

…….. **[4]**

66. Cookies are made using these ingredients.

Ingredients

Makes 12 cookies

120 g butter
180 g sugar
1 egg
120 g flour
85 g cranberries
50 g white chocolate

Alex makes 100 cookies.
They are put into packets, each holding 8 cookies.
Each packet of 8 cookies is sold for £1.55.
Alex sells all of these packets.

Work out how much money Alex receives.

£ ……..……..……..…… **[3]**

67(a). Here is a list of numbers.

6 17 20 27 38 50 75 102

From this list, write down

an odd number,

……..……..……..… **[1]**

(b). a cube number,

……..……..……..… **[1]**

(c). a factor of 51.

……..……..……..… **[1]**

68. Some boxes are each in the shape of a cuboid.
The base of each box is exactly 25 cm by 45 cm.

The boxes are to be placed on their base, side by side against a wall.
If all the shorter sides or if all the longer sides are against the wall, they fit perfectly with no gaps.

Find the shortest possible length of the wall.

..... cm **[4]**

69(a). Write down a factor of 12.

..... **[1]**

(b). Write down a square number between 20 and 30.

..... **[1]**

(c). Find the two numbers which multiply together to make 36 **and** add together to make 13.

..... and ..... **[2]**

70(a). Jane has these three number tiles.

Which one of Jane's tiles shows a prime number?
Write the number on the blank tile on the answer line.

..... **[1]**

(b). Write down a two-digit square number that can be made using two of Jane's tiles.

..... **[1]**

71. A pattern is made out of blue tiles and yellow tiles.

$\frac{1}{4}$ of the tiles are blue.
There are 39 yellow tiles.

Work out the **total** number of tiles.

…….. **[3]**

72. Work out, using your calculator.

$\sqrt{10.5^2 + 36^2}$

…….. **[2]**

73. Here are the ticket prices for a theme park when bought at the gate.

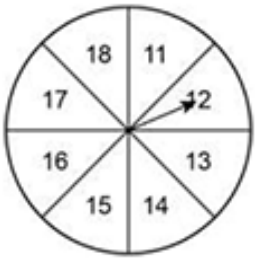
Adult	£24
Child	£19
Family ticket (2 adults and up to 4 children)	£90

Mr and Mrs Morris take their four children to the theme park.
They buy their tickets at the gate.

How much do Mr and Mrs Morris save by buying a family ticket?

£ …….. **[4]**

74. A student makes a fair 8-sided spinner.
They write the numbers 11, 12, 13, 14, 15, 16, 17 and 18 on the spinner.



Find the probability of the student's spinner landing on a multiple of 6.

…….…….…….. **[2]**

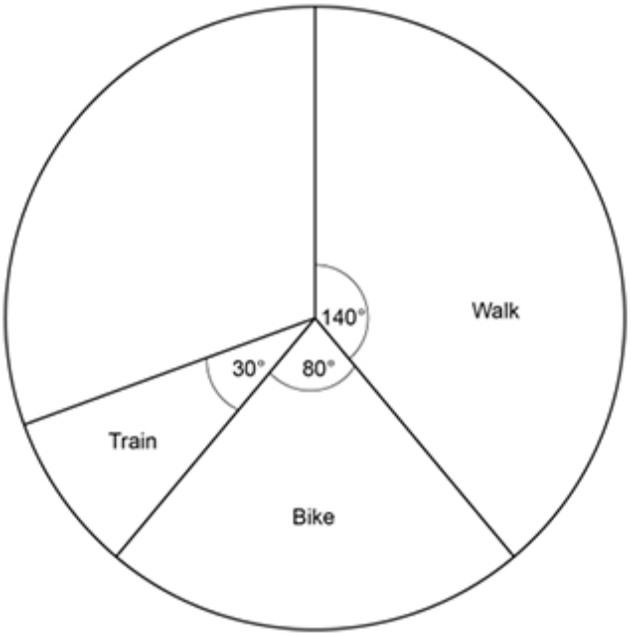
75. A village is putting on a fair.
30 child tickets are sold.
The ratio of the number of child tickets sold to the number of adult tickets sold is 3 : 5.

The cost of a child ticket is £1.50.
The cost of an adult ticket is £3.00.

Work out the **total** amount paid for the tickets.

£ …….…….…….. **[4]**

76(a). Some students were asked how they travel to school.
Each student gave one answer.
The pie chart shows the proportion who walk, or travel by bike, or train.



All of the remaining students travel to school either by bus or by car.
The ratio of the number who travel by bus to the number who travel by car is 3 : 2.

Complete the pie chart.
You must show your working.

[6]

(b). Which way of travelling to school is the mode?

…… **[1]**

77(a). Work out.

i. $6 - 7$

…… **[1]**

ii. $4 \times {}^{-}2$

…… **[1]**

iii. $\frac{3}{5} + \frac{1}{5}$

…… **[1]**

iv. $\frac{1}{2}$ of $7\frac{1}{2}$

…… **[1]**

(b). Write down the largest prime factor of 70.

…… **[2]**

78(a). Darcy is given this question.

Write 50 as a product of prime factors. Give your answer in index form.

Darcy's answer is $1 \times 2 \times 5^2$.

Is Darcy correct?
Explain your answer.

---------- **[1]**

(b). Work out.

$\sqrt{64} \times 3^2$

…… **[3]**

79(a). Work out.

$3 + {}^{-}5$

…… **[1]**

(b). ${}^{-}3 \times {}^{-}4$

…….. **[1]**

80(a). Work out.
6 + 14 ÷ 2

…….. **[1]**

(b). Insert one pair of brackets to make the calculation correct.

4 × 7 + 8 ÷ 4 = 9

[1]

81. A shopper buys 6 apples costing 55p each and 3 peaches.
They pay with a £5 note and receive 14p in change.
Each peach costs the same amount.

Work out the cost of one peach.
You must show your working.

…….. p **[5]**

82. A student thinks of a number.
They square it and then subtract 9.
Their answer is 315.

What number is the student thinking of?

…….. **[2]**

83(a). Write down:

An even number.

…….. **[1]**

(b). A cube number.

…….. **[1]**

(c). A prime number between 50 and 60.

…….. **[1]**

(d). A multiple of 7.

…….. **[1]**

84(a). Beth says

My normal typing speed is 45 words per minute.
Therefore, I estimate that my normal typing speed is about 280 characters per minute.

Each letter, space and piece of punctuation counts as a character.

How many letters per word is Beth most likely to have used in making the estimate?
Show how you decide.

..... **[3]**

(b). Beth starts some homework at their normal typing speed of 45 words per minute.
Beth types 48 words in 1 minute 24 seconds.

What may be true about the length of the words that Beth has just typed?
Show how you decide.

---

[3]

85. Rowan has 40 m of ribbon.
They cut the ribbon into lengths of 70 cm.

What is the least length of ribbon, in cm, that can be left over?
You must show your working.

..... cm **[5]**

86. Use your calculator to work out.

$\sqrt{441} - 17$

…….…….…….…….. **[1]**

87. There are 200 coins in a jar.
15% of the coins are 10p coins.

$\frac{3}{8}$ of the coins are 20p coins.

The rest of the coins are 5p coins.

Work out the total value, in £, of the 200 coins.
You must show your working.

£ ……..……..……..…… **[6]**

88. Insert one pair of brackets into each calculation to make it correct.

$$15 \div 7 - 2 = 3$$

$$5 \times 2 + 3 \times 2 = 26$$

[2]

89(a). In the number 34 752, the digit 4 represents four thousand.

Write in words what the digit 7 represents.

..... **[1]**

(b). Write eight million in figures.

..... **[1]**

90. What type of numbers are 2, 3 and 5?

Circle **one** answer from the list.

cube numbers even numbers odd numbers prime numbers square numbers

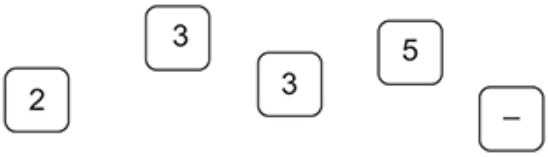
[1]

91. A family buys a television for £599.
They pay a deposit of £119.
They then pay the rest of the cost in 12 equal payments.

How much is each payment?

£ ..... **[2]**

92. These are five tiles.



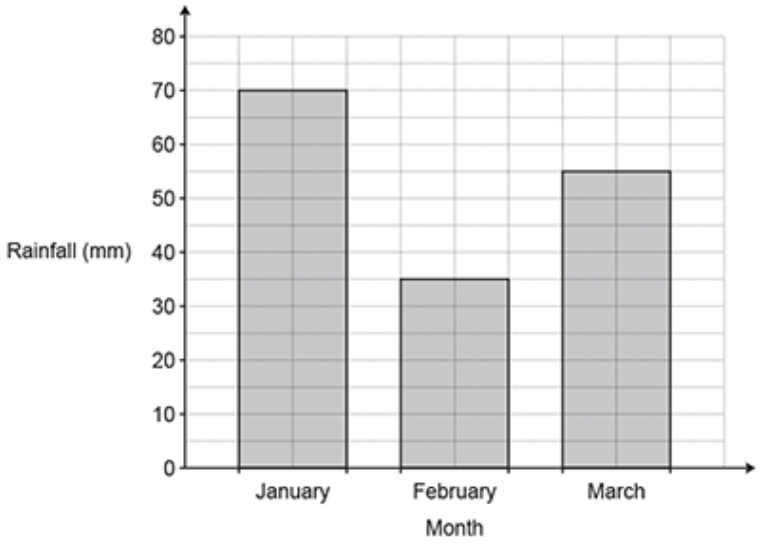
i. Arrange the five tiles to make a calculation with the answer 3.

..... **[1]**

ii. Write down a multiple of 8 that can be made using two of the five tiles.

..... **[1]**

93. The bar chart shows the rainfall, in millimetres (mm), for a city in the first three months of the year.



The total amount of rainfall in January and February was the same as the total amount of rainfall in March and April.

Work out the amount of rainfall in April.

..... mm **[3]**

94. Work out.

45 × 100

..... **[1]**

95. Complete the three missing values on this multiplication grid.

×	-5	9
-4	20	
		-54

[3]

96. Complete each statement.

..... × 4 = 12.08

[2]

97(a). Write down the **three** factors of 25.

..... , ... , and ..... **[2]**

(b). Write down a square number between 40 and 70.

..... **[1]**

98. The costs to hire a motorhome are shown below.

Motorhome hire	
First day	£130
Each extra day	£ 90
Each mile travelled	60p

Finley hired a motorhome and travelled 560 miles.
The total cost of hiring the motorhome was £916.

Calculate how many days Finley hired the motorhome for.
You must show your working.

..... days **[5]**

99. A climber is in a competition.

Here are their scores after two events.

Event	Score	
1	24	out of 30 points
2	32	out of 38 points
3		out of 52 points

Event 3 is out of 52 points.

The climber's overall score is found by adding the three scores together.

Find the score the climber needs in event 3 to achieve 85% of the total points.

..... **[4]**

100(a).

$2a = \sqrt{b}$ where *b* is a positive integer from 8 to 17.

Given that a is a positive integer, find its value.
You must show your working.

a = ... **[2]**

(b). How would your answer to **part (a)** change if a was only described as an integer?

---

[1]

101(a).

A recipe for biscuits says

Multiply the number of biscuits by 6.25 to find the number of grams of butter needed.

Darcie uses 125 g of butter.

How many biscuits does Darcie make?

..... **[2]**

(b). The estimated cost of driving

- an electric car is 68 pence per mile
- a petrol car is 77 pence per mile.

Charlie expects to drive 12 000 miles next year.

Use this information to work out how much money Charlie can expect to save next year if driving an electric car instead of a petrol car.

£ ..... **[3]**

102. The factors of 6 are 1, 2, 3 and 6.
The factors of 9 are 1, 3 and 9.

Write down the highest common factor (HCF) of 6 and 9.

..... **[1]**

103(a). Complete this prime factorisation of 100.
You may not need to use all of the answer lines.

100 = 2 × 2 × .....

.....

.....

[1]

(b). A teacher says that the cube root of their favourite number is 5.

Write down the teacher's favourite number.

..... **[1]**

104(a).

Work out.

$20 - 16 \div 2$

..... **[1]**

(b). Insert **one** pair of brackets to make this calculation correct.

$$2 + 7 - 3 \times 8 = 34$$

[1]

105. Trams to the airport leave every 50 minutes.
Trams to the beach leave every 35 minutes.
A tram to the airport and a tram to the beach leave together at 9:30 am.

When is the next time that two of these trams leave together?

..... **[4]**

106. Darcie makes 100 cookies.
They are put into packets, each holding 6 cookies.
Each packet of 6 cookies is sold for £1.35.
Darcie sells all of these packets.

Work out how much money Darcie receives.

£ ..... **[3]**

107(a). Here is a list of numbers.

8 11 19 26 39 49 65 114

From this list, write down

an even number,

..... **[1]**

(b). a square number,

..... **[1]**

(c). a factor of 57.

..... **[1]**

108(a).

An integer between 70 and 80 is written as the product of its prime factors as $2 \times 3 \times f$.

Find the value of f and the integer.

f = ...

Integer = ... **[3]**

(b). 98 and 147 are written as the product of their prime factors.

$98 = 2 \times 7^2$ $147 = 3 \times 7^2$

Work out the highest common factor (HCF) of 98 and 147.

..... **[2]**

109(a). Insert brackets to make this calculation correct.

$$5 - 5 \times 5 = 0$$

[1]

(b). Insert **two** of these symbols +, −, × or ÷ to make this calculation correct.

20 .... 5(1 .... 3) = 0

[1]

110. Two supermarkets, A and B, have special offers on the same packet of biscuits.

Supermarket A
Normal price:
£1.50 for each packet
Special offer:
Buy two packets at the normal price and get a third packet for half price

Supermarket B
Normal price:
£1.60 for each packet
Special offer:
10% off the normal price

Darcy buys **three** packets of these biscuits.

Which supermarket is best value for Darcy?
Show how you decide.

Supermarket _____ because _____

_____ **[3]**

111. Ashley has £7 to spend on fruit.
The table shows the prices.

Pineapple (each)	£1.15
Bananas (for 1 kilogram)	70p
Strawberries (for a 200 g pack)	£1.30

Ashley buys 2 pineapples and 3 kilograms of bananas.
Ashley spends the remaining money on strawberries.

Work out the **mass, in grams**, of strawberries that Ashley buys.
You must show your working.

..... g **[6]**

112. Write 36 as a product of prime factors.

..... **[2]**

113(a). Write a number in the box to make the statement true.

$\square - 7 = -11$

[1]

(b). $\frac{3}{\square} \div 2 = \frac{3}{10}$

[1]

(c). $\frac{\square}{\square} \times \frac{2}{3} = \frac{3}{5}$

[1]

114(a). Write down each of the following.

i. An even number between 11 and 17.

..... **[1]**

ii. A square number between 15 and 35.

..... **[1]**

iii. The cube root of 64.

..... **[1]**

(b). 3 is a factor of 51.

Find a factor of 51 between 10 and 20.

..... **[1]**

115. A pattern is made out of blue tiles and yellow tiles.

$\frac{1}{3}$ of the tiles are blue.
There are 36 yellow tiles.

Work out the **total** number of tiles.

..... **[3]**

116. Work out, using your calculator.

$\sqrt{17.5^2 + 60^2}$

..... **[2]**

117. Here are the ticket prices for a zoo when bought at the gate.

Adult	£22
Child	£18
Family ticket (2 adults and up to 4 children)	£80

Mr and Mrs Khan take their four children to the zoo.
They buy their tickets at the gate.

How much do Mr and Mrs Khan save by buying a family ticket?

£ ..... **[4]**

118. Here is a rule to work out the time, in minutes, needed to cook a turkey.

Ling's turkey takes 150 minutes to cook.

Use the rule to work out the weight of Ling's turkey.

..... kg **[2]**

119(a). Ashley has these three number tiles.

Which one of Ashley's tiles shows a cube number?
Write the number on the blank tile on the answer line.

..... **[1]**

(b). Write down a two-digit prime number that can be made using two of Ashley's tiles.

..... **[1]**

120. Some boxes are each in the shape of a cuboid.
The base of each box is exactly 35 cm by 45 cm.

The boxes are to be placed on their base, side by side against a wall.
If all the shorter sides or if all the longer sides are against the wall, they fit perfectly with no gaps.

Find the shortest possible length of the wall.

..... cm **[4]**

121(a).

Write down a factor of 18.

..... **[1]**

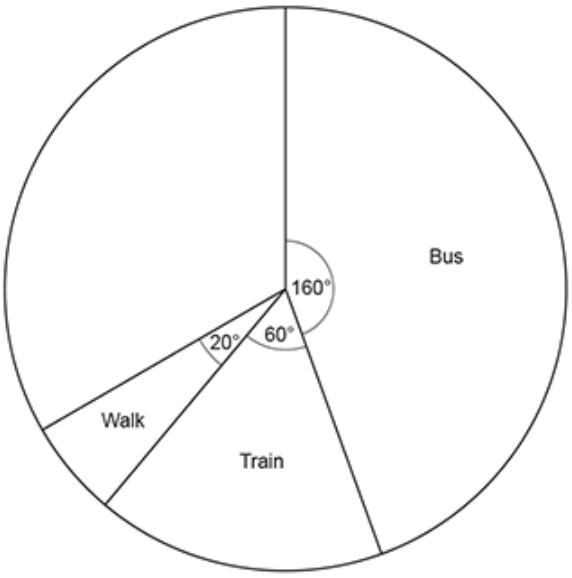
(b). Write down a square number between 10 and 20.

..... **[1]**

(c). Find the two numbers which multiply together to make 40 **and** add together to make 13.

..... and ..... **[2]**

122(a). Some students were asked how they travel to school.
Each student gave one answer.
The pie chart shows the proportion who travel by bus, by train or walk.



All of the remaining students travel to school either by bike or by car.
The ratio of the number who travel by bike to the number who travel by car is 2 : 3.

Complete the pie chart.

You must show your working.

[6]

(b). Which way of travelling to school is the mode?

..... **[1]**

123. A local theatre is putting on a show.
50 child tickets are sold.
The ratio of the number of child tickets sold to the number of adult tickets sold is 5 : 2.

The cost of a child ticket is £2.50.
The cost of an adult ticket is £5.00.

Work out the **total** amount paid for the tickets.

£ ..... **[4]**

124.

Work out.

i. $4 - 5$

(i) ..... **[1]**

ii. $2 \times {}^{-}3$

(ii) ..... **[1]**

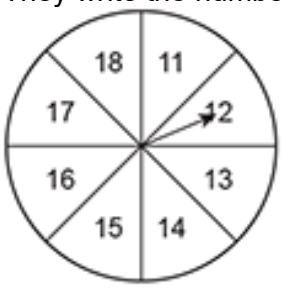
iii. $\frac{1}{7} + \frac{2}{7}$

(iii) ..... **[1]**

iv. $\frac{1}{2}$ of $1\frac{1}{2}$

(iv) ..... **[1]**

125. A student makes a fair 8-sided spinner.
They write the numbers 11, 12, 13, 14, 15, 16, 17 and 18 on the spinner.



Find the probability of the student's spinner landing on a multiple of 3.

..... **[2]**

126.

Write down the largest prime factor of 30.

.....**[2]**

127(a). Amit says

My normal typing speed is 40 words per minute.
Therefore, I estimate that my normal typing speed is about 210 characters per minute.

Each letter, space and piece of punctuation counts as a character.

How many letters per word is Amit most likely to have used in making the estimate?
Show how you decide.

..... **[3]**

(b). Amit starts some homework at their normal typing speed of 40 words per minute.
Amit types 52 words in 1 minute 12 seconds.

What may be true about the length of the words that Amit has just typed?
Show how you decide.

---

[3]

128. Ellis has 28 m of ribbon.
They cut the ribbon into lengths of 60 cm.

What is the least length of ribbon, in cm, that can be left over?
You must show your working.

..... cm **[5]**

129. Use your calculator to work out.

$\sqrt{196} + 29$

..... **[1]**

130. There are 150 coins in a jar.
20% of the coins are 10p coins.

$\frac{3}{10}$ of the coins are 20p coins.
The rest of the coins are 50p coins.

Work out the total value, in £, of the 150 coins.
You must show your working.

£ ..... **[6]**

131(a). Fountain A squirts water every 24 minutes.
Fountain B squirts water every 42 minutes.
They squirt water together at 15:19.

Find the next time they squirt water together.

..... **[4]**

(b). A school sends 60 students from Year 8 and 105 students from Year 9 to a museum.

The school divides these students into groups using the following rules.

- The groups must all be the same size.
- All students in any group must be from the same year.
- There should be as few groups as possible.

Find the size of each group and the total number of groups.

Size of each group = ...
Total number of groups = ... **[4]**

132(a). Write down an odd number.

..... **[1]**

(b). Write down a square number.

..... **[1]**

(c). Write down a prime number between 30 and 40.

..... **[1]**

(d). Write down a multiple of 8.

..... **[1]**

133. A student thinks of a number.
They square it and then add 6.
Their answer is 295.

What number is the student thinking of?

..... **[2]**

134(a). Reece is given this question.

Write 20 as a product of prime factors.
Give your answer in index form.

Reece's answer is 2 × 2 × 5.

Is Reece correct?
Explain your answer.

[1]

(b). Work out.

$\sqrt{81} \times 2^3$

..... **[3]**

135(a). Work out.

$^{-}7 + 10$

..... **[1]**

(b). $4 \times {}^{-}2$

..... **[1]**

136(a). Work out.

$4 + 16 \div 2$

..... **[1]**

(b). Insert one pair of brackets to make the calculation correct.

$5 \times 7 + 1 \div 9 = 4$ **[1]**

137. A shopper buys 4 apples costing 60 p each and 3 peaches.
They pay with a £5 note and receive 44 p in change.

Each peach costs the same amount.

Work out the cost of one peach.
You must show your working.

..... p **[5]**

END OF QUESTION PAPER