16 Plus

Paper [3]

Maths

Total marks: [52]

Time allowed: 60 minutes

Information for candidates

- You have 60 minutes.
- There are 52 marks available.
- Calculators are allowed.
- You must show your working.

Full name _____

Questions

1. Write $4^{18} \times 4^{3}$ as a single power of 4 (2 marks)

2. The grid shows information about the size of populations in various cities around the world.

City	Population
Tokyo	3.8×10^{7}
Delhi	2.8×10^{7}
Los Angeles	1.2×10^{7}
London	9.05×10^{6}

a. What is the difference in size between Tokyo and London? Express your answer in standard form. (3 marks)

b. If the populations of London and Bangkok are put together, the total is 1.925×10^{7}. Work out the population of Bangkok. Express your answer in standard form. (3 marks)

3. In 2013, Erisha buys a new caravan for £34,500.

The caravan depreciates in value by 18% each year.

In 2018, Erisha wants to sell the caravan. Work out the value of the caravan at the end of the 5 years.

Give your answer to the nearest £. (4 marks)

4. A regular polygon has *n* sides. Rupesh measures one of its internal angles with his protractor. It measures 156°. How many sides does the polygon have? (3 marks)

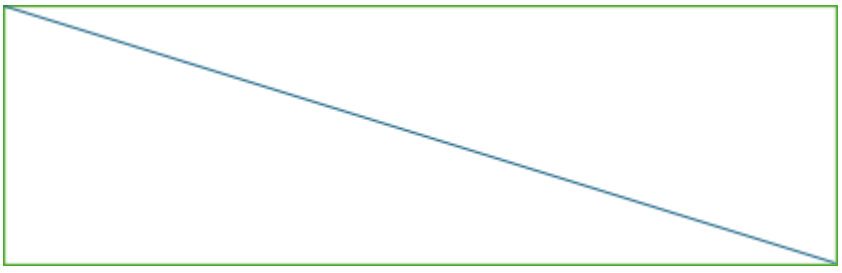
5. Alfred's football team is in a league. He records the goals scored over the season. Here are the number of goals scored each week by the teams in the league:

Week	1	2	3	4	5	6	7	8	9
Goals scored	15	13	11	6	10	13	14	17	9

a. What is the mean number of goals scored?
b. What is the modal class?
c. What is the range?

Total for question 5: 3 marks

6. In this picture there is a rectangle divided into two triangles. The area of the rectangle is 45cm^2. One side of the rectangle measures 5cm. What is the length of the diagonal of the rectangle? Give your answer correct to one decimal place. (4 marks)



7. A speedboat takes 4 hours 36 minutes to travel from Port A to Port B.

The boat travels 365km.

Work out the average speed of the boat in km/h.

Give your answer correct to the nearest whole number. (3 marks)

8. Change $36.4m^3$ into cm^3 (2 marks)

9. A triangle has three angles: (4y + 10)°, (y + 20)° and 30°. Work out the value of y and then give the sizes of all three angles. (3 marks)

10. List all the integer values of x if the following is true: (2 marks)

$-3 \leq x < 2$

11. Express 240 as a product of its prime factors. (2 marks)

12. Give the coordinates of the intersection of the lines $3x – y = 2$ and $2x + y = 8$ (3 marks)

13. There are 9 sweets in a jar, and 7 of them are strawberry. The other flavour is raspberry.

Mike takes two sweets from the jar without looking.

Work out the probability that Mike takes one raspberry sweet and one strawberry sweet. (4 marks)

14. Chiswell School have done a survey about their pets.

The number of dogs and the number of cats are in the ratio 7 : 4

The number of cats and the number of fish are in the ratio 8 : 5.

There are 50 fish in total.

How many dogs are there in total? (4 marks)

15. What is the size of one of the angles in a regular octagon? (2 marks)

16. Calculate these expressions and give your answer in its simplest form: (1 mark each)

a. The product of two elevenths and one third
b. The sum of three fifths and ten twentieths
c. Divide 12 by two thirds

17. What is the HCF of 4410 and 3300? (2 marks)

Answers

1. 4^{21}
2. a. 2.895×10^7 b. 1.02×10^7
3. £12791
4. 15 sides.
5. a 12 b. 13 c. 11
6. 10.3cm
7. 79km/h
8. 36, 400,000cm^3
9. y = 24°. Angles are 30°, 106° and 44°.
10. -3, -2, -1, 1
11. $2^4 \times 3 \times 5$
12. (2, 4)
13. 28/72
14. 140 dogs.
15. 135°
16. a. 2/33 b. 1 and 1/10 c. 18
17. 30