Owl Tutors

13 Plus

Paper [4]

Maths Non-Calculator

Total marks: [60]

Time allowed: 60 minutes

Instructions

- You have one hour
- Calculators are not allowed
- Show your working
- There are 60 marks available. If you get stuck on a question, go onto the next question and come back at the end.
- Use either pen or pencil and write your answers on the paper.

Full name _____

Questions

1. The Roundhouse Restaurant is having a sale on pizzas. On Mondays, they are offering 'buy one, get one half price'. On Tuesdays, they are offering a 20% discount on the total bill.

Pizzas cost £12.50.

a. Mike orders three pizzas on a Monday. How much will this cost? (2 marks)

b. Ed orders four pizzas on a Tuesday. How much will this cost? (2 marks)

2. Write these numbers in order from largest to smallest

0.032   0.0033   0.1   0.09

3. Work out 2367 x 132

4. Work out 306 ÷ 17

5. Which of these are integers?

Three quarters   six   -342   0.02

6. List the first four prime numbers in order.

7. How many prime numbers are there between 30 and 40? Can you write them? (2 marks)

8. Find the prime factorization of 2024. (2 marks)

9. Find the HCF of 22 and 110

10. Tim's lighthouse has two lights to warn ships not to get too close to the rocks. One light flashes every 14 seconds and the other flashes every two minutes. At 11pm, they both flash at the same time. What time does this happen next? (3 marks)

11. Mark sells his watch on an online auction website. He puts the price at £320. The final bid is 130% of the original price. The website takes 5% of the total. How much does he receive? (3 marks)

12. Estimate the value of 72.12 x 69.90. Express your answer as an integer. (2 marks)

13. What is the cube root of 125?

14. Work out and express as a power:

a. $9^8 \times 9^5$

b. $(3^3)^9$

c. $6^{11} \div 6^4$

15. Factorise the following expressions fully (2 marks each):

a. 36n + 12

b. $8xy^2 - 4xy - 2y$

16. A sequence begins with the following terms:

-3, -10, -17, -24

a. What is the rule for the nth term?

b. Is -143 a term in the sequence? Explain your answer. (2 marks)

17. Complete the table of values below for the equation $y = x^3 - 6$ (3 marks)

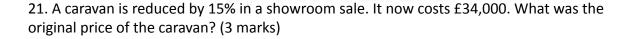| X	0	1	2	3	4	5
y						

18. Reduce 5: 60 to the form 1:*n*

19. 3 tutors teach 9 lessons every day. How many lessons every day could 7 tutors teach? (2 marks)

20. Martha has red balloons and blue balloons in the ratio 6:7.

She has 24 red balloons. How many balloons does Martha have in total? (2 marks)

21. A caravan is reduced by 15% in a showroom sale. It now costs £34,000. What was the original price of the caravan? (3 marks)

22. A regular polygon has 15 sides. Find the size of one of its **exterior** angles. (3 marks)

23. A right angled triangle has sides 6cm and 8cm. Find the length of the hypotenuse. (2 marks)

24. Express these probabilities as fractions:

a. Tomorrow being a day of the week that starts with T

b. The sun rising tomorrow morning

c. Your cat being taller than you

25. A class was asked how many pets they have at home.

Number of pets	Frequency
0	2
1	11
2	12
3	2
4	3

Find the mean number of pets rounded to the nearest integer. (3 marks)

26. a. Graham travels 34 miles to visit his friend in his car. His journey takes 40 minutes. What was his average speed in mph? (3 marks)

b. The following week, his friend Tony drives to visit him. Tony drives faster than Graham, at 55mph. How long will it take for Tony to get to Graham's house? Give your answer to the nearest minute. (2 marks)

Answers

1.a. £31.25   b. £40

2. 0.0033, 0.032, 0.09, 0.1

3. 312,444

4. 18

5. six and -342

6. 2, 3, 5, 7

7. Two – 31 and 37

8. 2^3 x 11 x 23

9. 11

10. 11.14pm or 2314.

11. £395.20

12. 5040

13. 5

14.a. 9^{13} b. 3^{27} c. 6^7

15.a. 12 (3n + 1)   b. 2y (4xy − 2x − 1)

16.a. -7n + 4   b. Yes, it is the 21st term, because -147 divides by 7 to make 21.

17.

X	0	1	2	3	4	5
y	-6	-3	2	21	58	119

18. 1:12

19. 21 lessons per day

20. 52 balloons

21. £40,000

22. 24° (1 mark for 156°)

23. 10cm

24a. 2/7   b. 1/1   c.0/1

25. 2 pets

26.a. 51mph   b. 37 minutes.