Test - Algebra: formulae, sequences and missing numbers

Year: Year 6 · Duration: 40 minutes · /20

Name:	Date:	**Mark: /20**

Question	1	2	3	4	5	Total
marks	3	4	4	4	5	**20**
Mark						

Show your working.

Question 1 (3 marks)

Question 1 – Formulae

The cost, in pounds, of hiring a boat is $C = 8 + 4h$, where h is the number of hours.

a. Work out the cost of hiring the boat for 3 hours.
b. A family pays £28. How many hours did they hire the boat for?
c. Write the formula for the perimeter of a rectangle and use it to find the perimeter of a rectangle with $l = 9$ cm and $w = 4$ cm.

Question 2 (4 marks)

Question 2 – Sequences

a. Write the next two terms of 3, 10, 17, 24, ...
b. Find the nth term of 6, 10, 14, 18, ...
c. Use your nth term from part (b) to find the 30th term.
d. Is 82 a term in the sequence in part (b)? Show your working.

Question 3 (4 marks)

Question 3 – Missing numbers

a. Solve $n + 14 = 39$.
b. Solve $5a = 65$.
c. Solve $3x + 7 = 34$.
d. Solve $4y - 9 = 19$.

Question 4 (4 marks)

Question 4 – Two unknowns

a. a and b are whole numbers with $a + b = 12$. Write down all the pairs where a is bigger than b.
b. Find three pairs of whole numbers x and y with $2x + y = 10$.
c. The sum of two numbers is 30. One number is 4 times the other. Find the numbers.

Question 5 (5 marks)

Question 5 – The school disco costs

The school hires a disco. The cost in pounds, C, for a disco lasting h hours is $C = 60 + 25h$.

Hours, h	1	2	3	4
Cost, C (£)	85	110	?	160

a. Fill in the missing cost for 3 hours.
b. What is the nth term rule for the cost sequence? Explain what the 60 and the 25 tell us.
c. The school has a budget of £200. What is the longest disco the school can pay for? Solve an equation.
d. A second company charges £40 plus £30 for each hour. Which company is cheaper for 5 hours and by how much?