Algebra and graphs: IGCSE Maths worksheet

Name	Date	Time allowed **45 minutes**	Total **30 marks**
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Instructions
Answer all questions. Show your working clearly: marks are given for each correct step. Write your answers in the spaces provided.

1 Simplify fully: **[2]**

$5x + 3y - 2x + 7y$

2 (a) Expand and simplify: $3(2x - 1) - 4(x - 5)$ **[4]**

(b) Factorise completely: $6a^2b - 9ab^2$

3 Solve the equation: **[3]**

$4(x + 3) = 2x - 6$

4 Priya is solving an inequality for a Science experiment. The temperature, t °C, of a liquid must satisfy: **[4]**

$3t - 5 \leq 16$

(a) Solve the inequality to find the range of values of t.

(b) Show the solution on a number line.

(c) Write down the largest integer value of t that satisfies the inequality.

5 The first five terms of a sequence are: **[4]**

4, 9, 14, 19, 24

(a) Find the common difference.

(b) Write down an expression, in terms of n, for the nth term of the sequence.

(c) Use your expression to find the 50th term of the sequence.

6 The nth term of a sequence is given by $T(n) = n^2 - 3$. **[3]**

Find the 1st, 2nd and 3rd terms of the sequence, and state whether 94 is a term of this sequence, giving a reason.

7 A straight line has equation $y = 2x - 3$. **[5]**

(a) Find the gradient of the line.

(b) Find the coordinates of the point where the line crosses the y-axis.

(c) Find the coordinates of the point where the line crosses the x-axis.

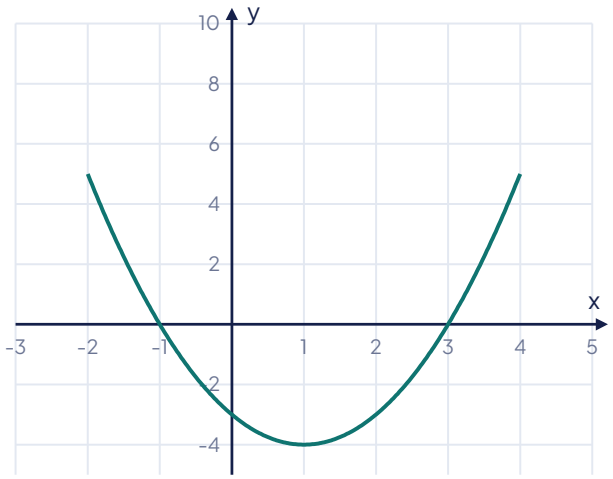
(d) A second line is parallel to $y = 2x - 3$ and passes through the point (0, 5). Write down the equation of this second line.

8 The graph shows the curve $y = x^2 - 2x - 3$ for values of x from –2 to 4. **[5]**

(a) Use the graph to write down the coordinates of the two points where the curve crosses the x-axis.

(b) Use the graph to write down the coordinates of the minimum point of the curve.

(c) By factorising $y = x^2 - 2x - 3$, confirm your answer to part (a).



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