

1.7 Quiz - Early Finishers: Sequences and quadratics, Complete on lined paper

1. The first term of an arithmetic sequence is 24 and the common difference is 16.

(a) Find the value of the 62nd term of the sequence. [2 marks]

The first term of a geometric sequence is 8. The 4th term of the geometric sequence is equal to the 13th term of the arithmetic sequence given above.

(b) Write down an equation using this information. [2 marks]

(c) Calculate the common ratio of the geometric sequence. [2 marks]

2. The 1st, 5th, and 13th terms of an arithmetic sequence, with common difference d , $d \neq 0$, are the first three terms of a geometric sequence, with common ratio r , $r \neq 1$. Given that the 1st term of both sequences is 12, find the value of d and the value of r . [6 marks]

3. Let $f(x) = 2x^2 + 3x - 1$. [6 marks]

(a) Write down the coordinates of the vertex.

(b) Hence or otherwise, express the function in the form $f(x) = 2(x - h)^2 + k$.

(c) Solve the equation $f(x) = 0$.

4. Consider the function $f(x) = x^2 - 6x - 1$.

(a) Sketch the graph of f , for $-4 \leq x \leq 3$.

(b) This function can also be written in the form $f(x) = (x - p)^2 - 10$.
Write down the value of p .

(c) The graph of g is obtained by reflecting the graph of f in the x -axis, followed by a translation of $(0, 4)$ (i.e. move the parabola up four).
Show that $g(x) = -x^2 + 6x + 5$.

(d) The graphs of f and g intersect at two points.
Write down the x -coordinates of these two points.

[8 marks]