

1.7 Quiz: Sequences, Open book: notes and calculator allowed

1. A sequence is defined as follows: 3, 7, 11, 15, ...

(a) Write down the first term u_1 . [1]

(b) Is the sequence arithmetic, geometric, or neither? [1]

(c) Find the value of the next term in the sequence. [1]

(d) Find a general expression for u_n , the n^{th} term. [3]

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2. The first three terms of a geometric sequence are 27, 9, 3, ...

(a) Find the common ratio r . [2]

(b) Find the next two terms in the sequence. [2]

(c) Find a general expression for u_n , the n^{th} term. [2]

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3. The fourth term of a geometric sequence $u_4 = 108$ and the fifth term $u_5 = 162$.

(a) Find the common ratio r . [1]

(b) Find the first term in the sequence. [3]

(c) Hence, find a general expression for u_n , the n^{th} term. [2]

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4. In an arithmetic sequence $u_5 = 38$ and $u_{13} = 86$.

(a) Find the common difference. [2]

(b) Find u_1 , the first term of the sequence. [2]

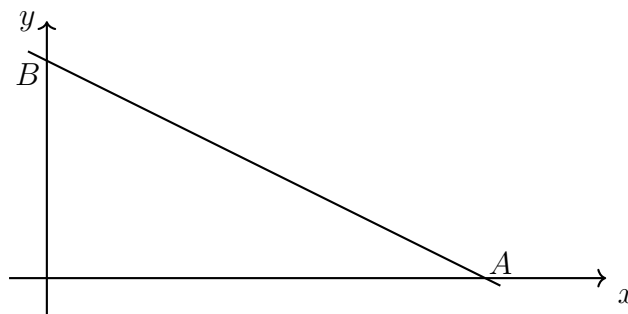
(c) Find the largest term in the sequence that is less than 200. [2]

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Challenge: Linear equations and quadratic functions

5. The diagram shows the straight line L_1 , which intersects the x -axis at $A(k, 0)$ and the y -axis at $B(0, 3)$.

diagram is not to scale



The gradient of L_1 is $-\frac{3}{4}$.

- (a) Write down the equation of the line L_1 . [1]
- (b) Find the value of k . [2]
- (c) The line L_2 is perpendicular to L_1 and passes through $(2, 1)$.
- i. Write down the gradient of the line L_2 . [1]
- ii. Hence, write down the equation of L_2 . Leave your answer in the form $y - a = m(x - b)$. [2]

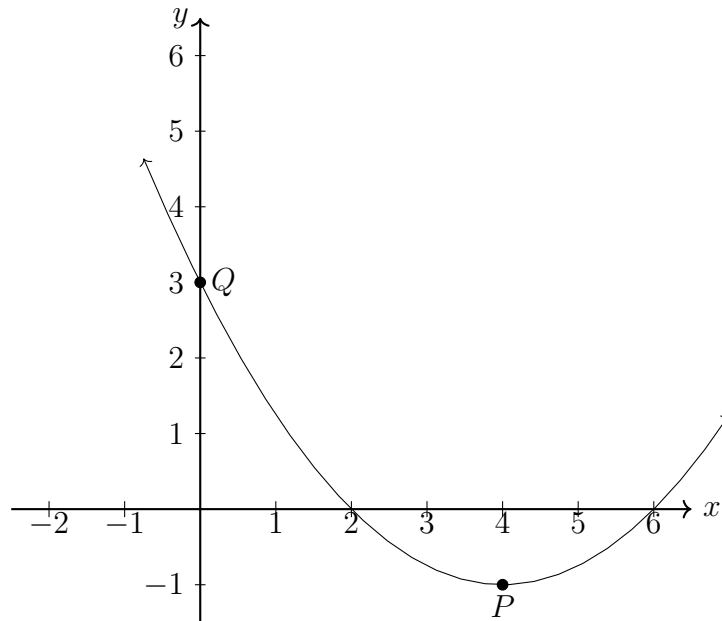
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6. Let f be a quadratic function. Part of the graph of f is shown below. The vertex is at $P(4, -1)$ and the y -intercept is at $Q(0, 3)$.



- (a) The function f can be written in the form $f(x) = a(x - h)^2 + k$. Write down the value of h and of k .
- (b) Find a .
- (c) Find the zeros of the function f , such that $f(x) = 0$.

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