

PAST YEARS EXAMINATION QUESTIONS

- 1 Find the values of m for which the line $y = mx - 9$ is a tangent to the curve $x^2 = 4y$. [4]
N2002/II/2
- 2 The speed v m s⁻¹ of a particle travelling from A to B , at time t s after leaving A , is given by $v = 10t - t^2$. The particle starts from rest at A and comes to rest at B . Show that the particle has a speed of 5 m s⁻¹ or greater for exactly $4\sqrt{5}$ s. [5]
N2002/II/3
- 3 (a) Find the set of values of x for which $3x^2 + 8x - 1 > 3x + 1$.
(b) Find the values of k for which the equation $2x^2 - 5kx + 13 = x^2 - 2x - 3$ has equal roots. [2]
N2002/II/9 (AO Maths)
- 4 Given that $\mathcal{E} = \{x: -5 < x < 5\}$,
 $A = \{x: 8 > 2x + 1\}$,
 $B = \{x: x^2 > x + 2\}$,
find the values of x which define the set $A \cap B$. [6]
N2002/II/4
- 5 Find the values of k for which the line $x + 3y = k$ and the curve $y^2 = 2x + 3$ do not intersect. [4]
N2003/II/1
- 6 Find the values of p for which $p^2 > 4(8 + p)$. [2]
N2003/II/7 (AO Maths)
- 7 Find the values of m for which the line $y = mx + 5$ is a tangent to the curve $\frac{x^2}{4} + \frac{y^2}{16} = 1$. [4]
N2003/II/8 (AO Maths)
- 8 Given that $\lambda \in \mathbb{R}$, find the set of values of λ for which the equation $5x^2 + 2x + 1 = x(8 - \lambda x)$ has two real unequal roots. [3]
N2004/II/2 (AO Maths)
- 9 Find the values of k for which the line $y = x + 2$ meets the curve $y^2 + (x + k)^2 = 2$. [5]
N2004/II/4
- 10 Find the set of values of x for which $(x - 6)^2 > x$. [3]
N2005/II/1
- 11 Find the values of the constant c for which the line $2y = x + c$ is a tangent to the curve $y = 2x + \frac{6}{x}$. [4]
N2005/II/3
- 12 Find the values of m for which the line $y = mx - 5$ is a tangent to the curve $y = x^2 + 3x + 4$. [2]
N2005/II/2 (AO Maths)
- 13 The line $y = 1 - 3x$ is a tangent to the curve $x^2 + y^2 + ky + 2y + 7 = 0$. Find the possible values of the constant k . [2]
N2006/II/7 (AO Maths)
- 14 (a) Find the value of m for which the line $y = mx - 3$ is a tangent to the curve $y = x + \frac{1}{x}$ and find the x -coordinate of the point at which this tangent touches the curve. [5]
(b) Find the value of c and of d for which $\{x: -5 < x < 3\}$ is the solution set of $x^2 + cx < d$. [2]
N2006/II/7
- 15 Find the set of values of the constant k for which the line $y = k(x - 1)$ intersects the curve $y = x^2 + 6x + k$ at two distinct points. [5]
N2007/II/1
- 16 The line $y = 3x - 2$ is a tangent to the curve $x^2 + y^2 + ax + 2y = 0$ at the point P . Find
(i) the value of the constant a ,
(ii) the coordinates of P . [2]
N2007/II/10 (AO Maths)
- 17 A function f is defined by $f: x \mapsto x^2 + 2x + c$ for $x \in \mathbb{R}$. Find the value of the constant c for which the range of f is given by $f(x) \geq 3$. [4]
N2007/II/10(a)
- 18 (a) Find the smallest value of the integer a for which $ax^2 + 5x + 2$ is positive for all values of x . [3]
(b) Find the smallest value of the integer b for which $-5x^2 + bx - 2$ is negative for all values of x . [3]
N2008/II/10
- 19 The roots of the quadratic equation $2x^2 - 4x + 3 = 0$ are α and β . Find the quadratic equation whose roots are $\alpha^2 + 2$ and $\beta^2 + 2$. [7]
N2008/II/2