

CIE
Pure Mathematics 1
分类真题
2020-2022 册

A Level Clouds 出品

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Chapter 1

Quadratics

Q1: 9709/11/S20

- 5** The equation of a line is $y = mx + c$, where m and c are constants, and the equation of a curve is $xy = 16$.

- (a) Given that the line is a tangent to the curve, express m in terms of c .

[3]

A large, faint watermark is printed diagonally across the page. The word "clouds" is repeated four times in a staggered, overlapping arrangement. Each instance of "clouds" is written in a bold, sans-serif font with a light gray fill and a darker gray outline. The watermark is oriented from the top-left towards the bottom-right.

- (b) Given instead that $m = -4$, find the set of values of c for which the line intersects the curve at two distinct points. [3]

[3]

The image consists of a continuous, horizontal repeating pattern. The word "ALIVE" is written in a bold, sans-serif font, rotated 45 degrees counter-clockwise. The letters are a light gray color. They are arranged in a staggered, overlapping fashion. Each "ALIVE" is positioned above a dotted horizontal line, which is itself part of a larger dotted grid. The background is plain white.

Q2: 9709/12/S20

- 6** The equation of a curve is $y = 2x^2 + kx + k - 1$, where k is a constant.

(a) Given that the line $y = 2x + 3$ is a tangent to the curve, find the value of k . [3]

It is now given that $k = 2$.

- (b) Express the equation of the curve in the form $y = 2(x + a)^2 + b$, where a and b are constants, and hence state the coordinates of the vertex of the curve. [3]

Q3: 9709/13/S20

- 1 Find the set of values of m for which the line with equation $y = mx + 1$ and the curve with equation $y = 3x^2 + 2x + 4$ intersect at two distinct points. [4]

Q4: 9709/11/W20

- 1 Find the set of values of m for which the line with equation $y = mx - 3$ and the curve with equation $y = 2x^2 + 5$ do not meet. [3]

Q5: 9709/12/W20

- 3 The equation of a curve is $y = 2x^2 + m(2x + 1)$, where m is a constant, and the equation of a line is $y = 6x + 4$.

Show that, for all values of m , the line intersects the curve at two distinct points.

[5]

Q6: 9709/13/W20

- 4 A curve has equation $y = 3x^2 - 4x + 4$ and a straight line has equation $y = mx + m - 1$, where m is a constant.

Find the set of values of m for which the curve and the line have two distinct points of intersection.

[5]

Q7: 9709/12/M21

- 2 By using a suitable substitution, solve the equation

$$(2x - 3)^2 - \frac{4}{(2x - 3)^2} - 3 = 0.$$

[4]

Q8: 9709/12/M21

- 4 A line has equation $y = 3x + k$ and a curve has equation $y = x^2 + kx + 6$, where k is a constant.

Find the set of values of k for which the line and curve have two distinct points of intersection. [5]

Q9: 9709/11/S21

- 6** The equation of a curve is $y = (2k - 3)x^2 - kx - (k - 2)$, where k is a constant. The line $y = 3x - 4$ is a tangent to the curve.

Find the value of k .

[5]