

Cambridge International AS & A Level

Mathematics 9709

Paper 1 Pure Mathematics 1

Topic 1-Quadratics

Question No (3)

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Question No (3)

Determine the set of values of the constant k for which the line $y = 4x + k$ does not intersect the curve $y = x^2$.

Solution

DATE :-

Given equations

Equation of line, $y = 4x + k \rightarrow ①$ Equation of curve, $y = x^2 \rightarrow ②$

put Equation ① in ②

$$4x + k = x^2$$

$$x^2 - 4x - k = 0$$

when line does not intersect the curve

$$b^2 - 4ac < 0$$

$$\text{Disc} = b^2 - 4ac$$

$$(4)^2 - 4(1)(-k) < 0$$

$$16 + 4k < 0$$

$$4k < -16$$

$$k < -\frac{16}{4}$$

$$k < -4$$

So for value $k < -4$, line does not intersect the curve.

