Test - Parametric equations

Year: Year 13 · Duration: 35 minutes · /20

Name:	Date:	**Mark: /20**

Question	1	2	3	4	5	Total
marks	4	4	4	4	4	**20**
Mark						

Show your working.

Question 1 (4 marks)

Question 1 – Table and Cartesian equation

A curve has parametric equations $x = 3t - 1$, $y = t^2 + 2$.

a. Find the value of t at the point $(8, 11)$. [2 marks]
b. Find the Cartesian equation of the curve. [2 marks]

Question 2 (4 marks)

Question 2 – A circle

A curve has parametric equations $x = 1 + 3\cos t$, $y = 2 + 3\sin t$. Find its Cartesian equation, and state the centre and radius.

Question 3 (4 marks)

Question 3 – A restricted curve

A curve is given by $x = \sin t$, $y = \cos 2t$.

a. Show that $y = 1 - 2x^2$. [2 marks]
b. State the range of x and of y. [2 marks]

Question 4 (4 marks)

Question 4 – Intersection with a line

The curve $x = t^2$, $y = 2t$ meets the line $y = x - 8$ at two points. Find their coordinates.

Question 5 (4 marks)

Question 5 – A thrown ball

A ball is thrown so that its path is $x = 12t$, $y = 2 + 10t - 4.9t^2$ (metres, seconds).

a. Find the greatest height and the horizontal range. [3 marks]
b. State one assumption of the model. [1 mark]