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A LEVEL MATHS

(41) Parametric Equations Evaluating and Converting

WORKING AT D/E

(1) A curve has parametric equations:

$$x = t - 2, \qquad y = t^2, \qquad -8 \le t \le 4$$

(a) Find a cartesian equation for the curve in the form $y = f(x)$

(b) Show that the domain of $f(x)$ is $-10 \le x \le 2$

(c) Show that the range of $f(x)$ is $0 \le f(x) \le 64$

(d) Hence, sketch the graph of $y = f(x)$

(2) A curve has parametric equations:

$$x = \ln t, \qquad y = 4 - t, \qquad t > 0$$

(a) Show that the cartesian equation for the curve is $y = 4 - e^x$

(b) Explain why the domain of the cartesian equation is $x \epsilon R$.

(c) Show that the range of the cartesian equation is $y < 4$

(d) Hence, sketch the graph of $y = f(x)$

WORKING AT B/C

(1) A curve has parametric equations:

$$x = e^{2t}, \qquad y = 1 + t, \qquad t \in R$$

(a) Find a cartesian equation for the curve in the form $y = f(x)$

(b) Find the domain and range of the cartesian equation.

(2) A curve has parametric equations:

$$x = \frac{1}{t-3}, \qquad y = \frac{1}{t+9}, \qquad 4 < t < 5$$

(a) Show that the cartesian equation for the curve can be written as $y = \frac{x}{12x+1}$

(b) Find the domain of $f(x)$

(c) Hence, find the range of $f(x)$

(3) A curve has parametric equations:

$$x = \ln(t-3), \qquad y = \frac{1}{t}, \qquad t > 4$$

(a) Find a cartesian equation for the curve in the form $y = f(x)$

(b) Find the domain and range of the cartesian equation.

WORKING AT A*/A

(1) A curve has parametric equations:

$$x = 2\sqrt{t}, \qquad y = 256t^3, \qquad t \ge 0$$

Find the cartesian equation in the form $y = Ax^n$ stating the domain and the range of the function.

(2) A curve has parametric equations:

$$x = e^{2t-1}, \qquad y = \sqrt{t}, \qquad t \ge 0$$

(a) Find the cartesian equation in the form $y = f(x)$

(b) State the domain of the cartesian equation in exact form.

(c) State the range of the cartesian function.

(3) A curve has parametric equations:

$$x = t - 4, \qquad y = -t^3, \qquad t \in R$$

(a) Find a cartesian equation for the curve in the form $y = f(x)$

(b) Hence, sketch the graph of $y = f(x)$ stating the domain and the range.