2.3 Homework

A-Level Pure Mathematics : Year 2

Differentiation IV

Any solution based entirely on graphical
or numerical methods is not acceptable

Marks Available : 20

Question 1

Find a Cartesian equations of each of these curves in the form $y = f(x)$,

(i) $x = \dfrac{12}{t}$, $y = t^2 + t$

(ii) $x = 4\sqrt{t}$, $y = 7t^2$

[3, 3 marks]

(iii) $x = e^{2t}$, $y = e^{6t} - 1$

(iv) $x = \sqrt{t + 1}$, $y = t^2$

[3, 3 marks]

Question 2

Find an equation of the form $a\,x^2 + b\,y^2 = c$, where a, b and c are integer constants to be found, for the following pair of parametric equations

$$x = 35\cos\theta^\circ$$

$$y = 20\sin\theta^\circ$$

[4 marks]

Question 3

Show that the parametric equations

$$x = \frac{1}{t - 1}$$

$$y = \frac{1}{t + 1}$$

can be written in the form $y = \dfrac{x}{a + bx}$ where a and b are integers to be determined.

[4 marks]