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)
$$x = \frac{12}{t}$$
 (ii) $x = 4\sqrt{t}$
 $y = t^2 + t$ $y = 7t^2$

[3, 3 marks]

(iii)
$$x = e^{2t}$$
 (iv) $x = \sqrt{t+1}$
 $y = e^{6t} - 1$ $y = t^2$

[3, 3 marks]

Question 2

Find an equation of the form $ax^2 + by^2 = c$, 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 $y = \frac{x}{a + bx}$ where a and b are integers to be determined.

[4 marks]

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Teachers may obtain detailed worked solutions to the exercises by email from mhh@shrewsbury.org.uk