MIE100 Midterm Test
Thursday March 4, 2010
Start Time: 6:10pm Duration: 1 hr 30 min
Aids Allowed: Non-programmable calculator and one 8.5x11" aid sheet

Instructions: Write your full name, student number, course information and tutorial section number on each exam booklet you use. You may keep this test paper. Answer all three questions.

Question 1

An object, P, travels along $y = 4$ with velocity $\vec{v} = (2x + 1)\hat{i}$ m/s. The scale on both the x and y axes is metres. A camera is positioned at the origin, O, and is aimed to track the motion of P.

(i) Using polar co-ordinates centered at O as shown, what is the rate of rotation of the camera, $\dot{\theta}$, when $\theta = 45^{o}$? [15 marks]

(ii) What is $\ddot{\theta}$ when $\theta = 45^{o}$? [20 marks]