

MAS115: Presentation Homework 1.

Toby O'Connor

October 6, 2013

1 Question.

Let $y = e^x \cos x$. Show that the stationary points on the curve occur precisely where $\tan x = 1$.

2 Solution.

Using the chain rule, we can differentiate $y = e^x \cos x$ to get

$$\frac{dy}{dx} = e^x \cos x - e^x \sin x.$$

This can be simplified as $e^x(\cos x - \sin x)$. When this is equal to 0, we have a stationary point on our curve. So,

$$e^x(\cos x - \sin x) = 0,$$

which is true when $\cos x = \sin x$. If we divide both sides of the equation by $\cos x$, we get the result $\tan x = 1$.