MATH6015: Test 2 Sample Winter 2016

This is the same as the sample in the notes except that questions four and six have been replaced by a single question on area.

Answer all questions. Marks may be lost if necessary work is not clearly shown.

1. Find $\int \left(4t^4 - \frac{3}{t} - 5e^{-0.1t} - 1\right) dt$.

[5 Marks]

2. Evaluate $\int_0^4 \frac{16}{x^2+16}\, dx$

[5 Marks]

3. Evaluate $\int_0^1 x(0.01x - x^2)\, dx$.

[5 Marks]

4. Find $\int 9x^2(x^3+2)^{10}\, dx$.

[5 Marks]

5. Find $\int \sec^2(e^x)2e^x\, dx$.

[5 Marks]

6. Find $\int \frac{(\ln y)^2}{y}\, dy$.

[5 Marks]

7. (a) Find the intersection of the curves $y = x$ and $y = 4x - x^2$.

[3 Marks]

   (b) Hence, on a single diagram, draw a *rough* sketch of the curves $y = x$ and $y = 4x - x^2$.

[1 Mark]

   (c) Hence, find the area enclosed by the two curves.

[6 Marks]