

ID:

November 10, 2016

Quiz 4 - No work = No marks (50 min)

Choose 1 exercise from each topic

Cylindrical Shells

Exercise 1: (5 points)

Use the shell method to find the volume of the solid generated by revolving the region bounded by the curve $x = -y^2 + 2y$ and the line $x = 0$ about the x-axis.

Exercise 2: (5 points)

Use the method of “Cylindrical shells” to find the volume of the solid generated by revolving the region bounded by the curve $y = x^3$, $y = 0$ and $x = 1$ about $y = 1$.

Average value of a function

Exercise 3: (5 points)

Find the average value of the function $f(x) = 45 - 10\cos\left(\frac{\pi x}{12}\right)$ over the interval $[0, 24]$

Exercise 4: (5 points)

Find b such that the average value of the function $f(x) = 3x^2 - 2ax + b$ where $a \neq 1$ over $[1, a]$ is 4.

Integration by parts

Exercise 5: (5 points)

Use substitution techniques first then integration by parts to evaluate the following integrals:

a) $I = \int \text{Arctan}(4t) dt$

b) $I = \int_0^t e^s \sin(t - s) ds$

Exercise 6: (5 points)

Use integration by parts twice to evaluate the following integral:

$$I = \int x^3 (\ln x)^2 dx$$

Student's work (use the front and the back of the page only)