MG5004 Tutorial 3   **Family Name** ………………..……**Given Name**………………………

1   The average value of a complex voltage waveform is given by:
   $V_{AV} = \frac{1}{\pi}\int_0^\pi (5sin\omega t + 2sin3\omega t + sin5\omega t)d(\omega t)$. Evaluate V_{AV} .

(3 marks)

2   Determine: $\int 7cos^3 t. sint\, dt$

(3 marks)

3   The time taken, t hours, for a vehicle to reach a velocity of 80 km/h with an initial speed of 40 km/h is given by:

$$t = \int_{40}^{80} \frac{dv}{600 - 4v}$$

Where v is the velocity in km/h. determine t in minutes.

(3 marks)

4   Determine: $\int 4\cos^3 2t \, dt$

(3 marks)

5   Determine:

$$-2 \int_{0}^{\pi/3} \sin4\theta \sin2\theta \; d\theta$$

(3 marks)

6   Determine:

$$\int \frac{4}{9 + t^2} \, dt$$

(4 marks)

7   Determine:

$$\int_{2}^{5} \sqrt{x^5} \ln x \, dx$$

(5 marks)