

Mechanics I – Quiz 1 - C

2019-2020

Full Name:..... **KEY**

- 1- The speed v in m/s of an automobile is given by $v = at^3 + bt^2$, where the time t is in seconds. Determine the dimensions of a and b .

$$v = at^3 + bt^2$$

$$\frac{L}{T} = aT^3 + bT^2$$

↓ ↓
 $\frac{L}{T}$ $\frac{L}{T}$

$$aT^3 = \frac{L}{T}$$

$$a = \frac{L}{T^4}$$

$$bT^2 = \frac{L}{T}$$

$$b = \frac{L}{T^3}$$

2) A car moves at speed of 0.98 miles per minute. Use the following conversion factors to find its speed in kilometers per hour (km/h). 1 mile = 1600 m.

$$0,98 \frac{\text{miles}}{\text{min}} = ? \frac{\text{km}}{\text{h}}$$

$$0,98 \frac{\text{miles}}{\text{min}} = \frac{60 \text{ min}}{\text{h}} \cdot \frac{1600 \text{ m}}{\text{mile}} \cdot \frac{\text{km}}{1000 \text{ m}}$$

$$0,98 \times 60 \times 1600 \times \frac{1}{1000} = 94,08 \frac{\text{km}}{\text{h}}$$