Course name: [Course Code]

[Javier Perez Tobia]

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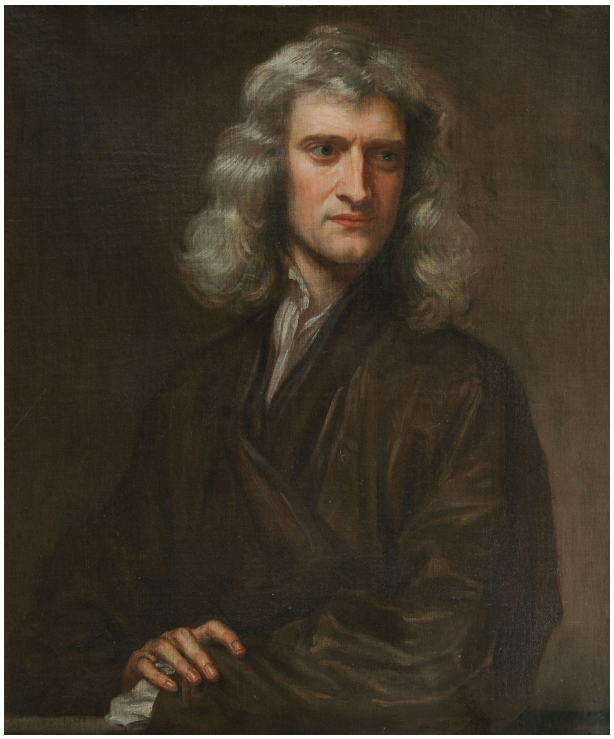

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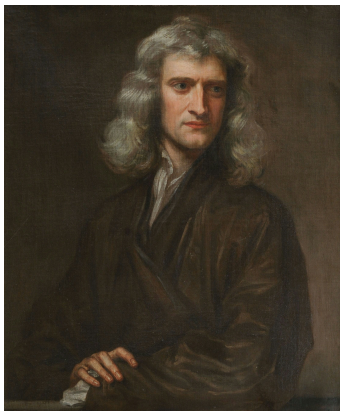
2 Newton's equations of motion

2.1 Main equations



$$v_t = v_0 + at \tag{1}$$

$$s_t = s_0 + v_0 t + \frac{1}{2}at^2 \tag{2}$$

2.2 Derived equations

Now, solving for t in 1 we can derive the following:

$$\frac{v_t - v_0}{a} = t \tag{3}$$

Plugging into 2 we get:

$$s_t = s_0 + v_0\frac{v_t - v_0}{a} + \frac{1}{2}a\left(\frac{v_t - v_0}{a}\right)^2$$

$$a(s_t - s_0) = v_0 v_t - v_0^2 + \frac{1}{2}(v_t^2 + v_0^2 - 2v_0 v_t)$$

$$a(s_t - s_0) = \frac{1}{2}(v_t^2 - v_0^2)$$

Finally arriving to:

$$v_t^2 = v_0^2 + 2a(s_t - s_0) \tag{4}$$

3 Other equation