2-3)

$$v(t) = 3t^3 - 6t^2 + 4t + 2,$$

a) The acceleration is found from the definition a = *d*v/*d*t:

a(t) = $9t^2$ -12t +4.

At t = 2, this is a(2) = $9(2^2)$ -12(2) + 4 = 16 m/s^2.

b) The displacement can be found from the integral:

$$\Delta x = \int_{t1}^{t2} v(t)dt$$

$$x = x_i + \int_0^2 (3t^3 - 6t^2 + 4t + 2)\, dt = 0 + \left[\frac{3}{4}t^4 - 2t^3 + 2t^2 + 2t\right]\Big|_0^2$$

$$= \frac{3}{4}\times 2^4 - 2\times 2^3 + 2\times 2^2 + 2\times 2 = 8m$$