7. Using $x = 3t - 4t^2 + t^3$ with SI units understood is efficient (and is the approach we will use), but if we wished to make the units explicit we would write $x = (3\,\text{m/s})t - (4\,\text{m/s}^2)t^2 + (1\,\text{m/s}^3)t^3$. We will quote our answers to one or two significant figures, and not try to follow the significant figure rules rigorously.

   (a) Plugging in $t = 1$ s yields $x = 0$. With $t = 2$ s we get $x = -2$ m. Similarly, $t = 3$ s yields $x = 0$ and $t = 4$ s yields $x = 12$ m. For later reference, we also note that the position at $t = 0$ is $x = 0$.

   (b) The position at $t = 0$ is subtracted from the position at $t = 4$ s to find the displacement $\Delta x = 12$ m.

   (c) The position at $t = 2$ s is subtracted from the position at $t = 4$ s to give the displacement $\Delta x = 14$ m. Eq. 2-2, then, leads to

$$v_{\text{avg}} = \frac{\Delta x}{\Delta t} = \frac{14}{2} = 7 \text{ m/s} .$$

   (d) The horizontal axis is $0 \leq t \leq 4$ with SI units understood.

Not shown is a straight line drawn from the point at $(t, x) = (2, -2)$ to the highest point shown (at $t = 4$ s) which would represent the answer for part (c).