Practice – 1

Once you feel confident with distance, displacement, and velocity, complete problems 1 to 3. Check your answers by going to the Solutions tab in Moodle.

Instructions: Answer each of the following practice questions on a separate piece of paper. Step by step solutions are provided under the Solutions tab. You will learn the material more thoroughly if you complete the questions before checking the answers.

1. Find each position function from the given velocity functions and initial conditions. Assume $t \geq 0$.

   a. $v(t) = (t-1)^{\frac{1}{2}}$, $s(t) = 4$ when $t = 2$

   b. $v(t) = 2\cos 3t$, $s(t) = -1$ when $t = \frac{\pi}{6}$

   c. $v(t) = (1-2t)^3$, $s(t) = 1$ when $t = 0$

2. The velocity $v(t)$, in m/s, of an object moving in a straight line is given by $v(t) = 3t^2 - 6t$. How far does the object travel from $t = 0\,\text{s}$ to $t = 3\,\text{s}$? Assume $s(t) = 0\,\text{m}$ when $t = 0\,\text{s}$.

3. The brakes are applied in a car travelling downhill at $40\,\text{m/s}$. The velocity $v(t)$ of the car at time t seconds after the brakes are applied is given by $v(t) = 40 - 5t^{\frac{3}{2}}$. How far will the car travel before coming to rest?