# Using Maple to do Integrals

1. Find the following integrals:

$$\int t^2 \cos(3t)\, dt \tag{1}$$

$$\int e^{-x^2}\, dx \tag{2}$$

$$\int e^{2x} \sin(x)\, dx \tag{3}$$

$$\int x^4 \sin(2x)\, dx \tag{4}$$

$$\int_0^4 x^4 \sin(2x)\, dx \tag{5}$$

$$\int \frac{1}{\sqrt{9 - x^2}}\, dx \tag{6}$$

$$\int \sin^4(z)\, dz \tag{7}$$

2. Let the velocity of a rabbit be given by $v(t) = 4te^{-t}$, where $t$ is measured in seconds and $v(t)$ in meters per second.

   (a) Plot $v(t)$.

   (b) How far does the rabbit hop in four seconds, starting at $t = 0$? Call this distance $d$.

   (c) How long does it take the rabbit to hop a distance $d/2$?

3. Repeat the above question, but use the velocity function $v(t) = t^2 \sin(\frac{1}{10})e^{-t/2}$.