Math 308 Maple Quiz 1 Summer 2003

Sec 301,302 Sample

```
> restart; with(DEtools):
```

#1

```
> deq:=diff(y(t),t,t) + 4*diff(y(t),t) + 5*y(t) = 5*cos(4*t);
```

$$deq := 5\,y(t) + 4\left(\frac{d}{dt}\,y(t)\right) + \left(\frac{d^2}{dt^2}\,y(t)\right) = 5\cos(4\,t)$$
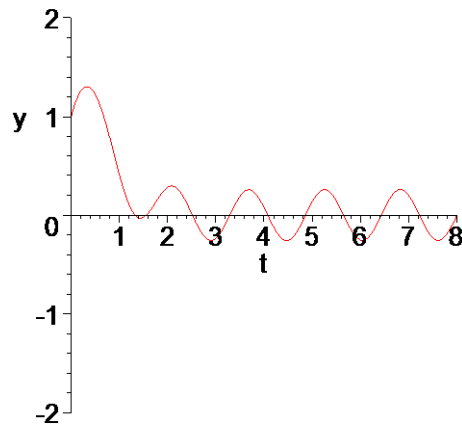
```
> inits:=y(0)=1, D(y)(0)=2;
```

$$inits := y(0) = 1, \mathrm{D}(y)(0) = 2$$

```
> sol:=dsolve({deq,inits},y(t));
```

$$sol := y(t) = \frac{1298}{377}\,\mathbf{e}^{(-2\,t)}\sin(t) + \frac{432}{377}\,\mathbf{e}^{(-2\,t)}\cos(t) + \frac{80}{377}\sin(4\,t) - \frac{55}{377}\cos(4\,t)$$

```
> plot(rhs(sol),t=0..8, y=-2..2);
```



```
> subs(t=5,rhs(sol)); evalf(%);
```

$$\frac{1298}{377}\,\mathbf{e}^{(-10)}\sin(5) + \frac{432}{377}\,\mathbf{e}^{(-10)}\cos(5) + \frac{80}{377}\sin(20) - \frac{55}{377}\cos(20)$$

$$0.1340587839$$