> $eq1 := diff(x(t), t\$4) - x(t) = 0$

$$eq1 := \frac{d^4}{dt^4} x(t) - x(t) = 0 \quad (1)$$

> $dsolve(eq1, x(t))$

$$x(t) = c_1 e^{-t} + c_2 e^{t} + c_3 \sin(t) + c_4 \cos(t) \quad (2)$$

> $dsolve(diff(x(t), t) + t \cdot x(t) = 0, x(t))$

$$x(t) = c_1 e^{-\frac{t^2}{2}} \quad (3)$$

> $dsolve(diff(x(t), t\$2) + diff(x(t), t) = 0, x(t))$

$$x(t) = c_1 + c_2 e^{-t} \quad (4)$$

> $dsolve(4\, diff(x(t), t\$2) + 8\, diff(x(t), t) + 5\, x(t) = 0, x(t))$

$$x(t) = c_1 e^{-t} \sin\left(\frac{t}{2}\right) + c_2 e^{-t} \cos\left(\frac{t}{2}\right) \quad (5)$$

> $dsolve(diff(x(t), t\$2) - 3\, diff(x(t), t) + 2\, x(t) = 0, x(t))$

$$x(t) = c_1 e^{t} + c_2 e^{2t} \quad (6)$$

> $ic := x\left(\frac{Pi}{2}\right) = 1, D(x)\left(\frac{Pi}{2}\right) = -2$

$$ic := x\left(\frac{\pi}{2}\right) = 1, D(x)\left(\frac{\pi}{2}\right) = -2 \quad (7)$$

> $dsolve(\{diff(x(t), t\$2) + x(t) = 0, ic\}, x(t))$

$$x(t) = \sin(t) + 2\cos(t) \quad (8)$$

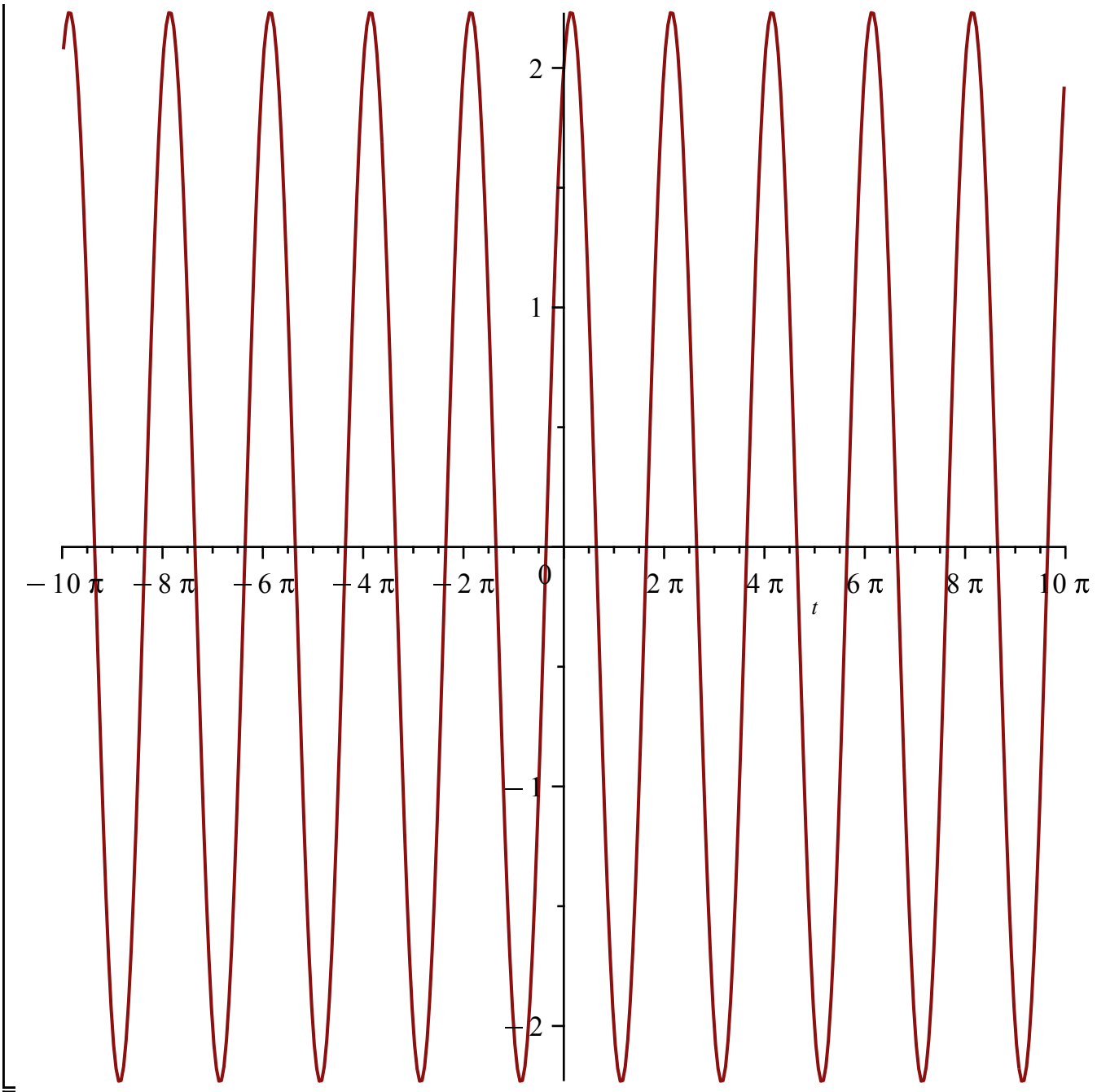
> $expand\left(\sqrt{5} \cdot \cos\left(t - \arctan\left(\frac{1}{2}\right)\right)\right)$

$$\sin(t) + 2\cos(t) \quad (9)$$

> $with(plots)$

[*animate*, *animate3d*, *animatecurve*, *arrow*, *changecoords*, *complexplot*, *complexplot3d*, *conformal*, *conformal3d*, *contourplot*, *contourplot3d*, *coordplot*, *coordplot3d*, *densityplot*, *display*, *dualaxisplot*, *fieldplot*, *fieldplot3d*, *gradplot*, *gradplot3d*, *implicitplot*, *implicitplot3d*, *inequal*, *interactive*, *interactiveparams*, *intersectplot*, *listcontplot*, *listcontplot3d*, *listdensityplot*, *listplot*, *listplot3d*, *loglogplot*, *logplot*, *matrixplot*, *multiple*, *odeplot*, *pareto*, *plotcompare*, *pointplot*, *pointplot3d*, *polarplot*, *polygonplot*, *polygonplot3d*, *polyhedra_supported*, *polyhedraplot*, *rootlocus*, *semilogplot*, *setcolors*, *setoptions*, *setoptions3d*, *shadebetween*, *spacecurve*, *sparsematrixplot*, *surfdata*, *textplot*, *textplot3d*, *tubeplot*] (10)

> $plot(\sin(t) + 2 \cdot \cos(t), t = -10\ Pi..10\ Pi)$



> $ic := x(0) = 0, D(x)(0) = 0.5$

$$ic := x(0) = 0, D(x)(0) = 0.5 \quad \textbf{(11)}$$

> $dsolve(\{4\,diff(x(t), t\$2) + 8\,diff(x(t), t) + 5\,x(t) = 0, ic\}, x(t))$

$$x(t) = e^{-t} \sin\left(\frac{t}{2}\right) \quad \textbf{(12)}$$

> $ic := x(0) = 2, D(x)(0) = 3$

$$ic := x(0) = 2, D(x)(0) = 3 \quad \textbf{(13)}$$

> $dsolve(diff(x(t), t\$2) + 5 \cdot x(t) = 0, x(t))$

$$x(t) = c_1 \sin\left(\sqrt{5}\ t\right) + c_2 \cos\left(\sqrt{5}\ t\right) \quad \textbf{(14)}$$

> $dsolve(diff(x(t), t\$2) + t \cdot x(t) = 0, x(t))$

(15)

$$x(t) = c_1\,\mathrm{AiryAi}(-t) + c_2\,\mathrm{AiryBi}(-t) \tag{15}$$

```
> dsolve(diff(x(t), t$2) + t^5·x(t) = 0, x(t))
```

$$x(t) = c_1\sqrt{t}\,\mathrm{BesselJ}\left(\frac{1}{7}, \frac{2\,t^{7/2}}{7}\right) + c_2\sqrt{t}\,\mathrm{BesselY}\left(\frac{1}{7}, \frac{2\,t^{7/2}}{7}\right) \tag{16}$$

```
> ic := x(0) = 0, D(x)(0) = 0
```

$$ic := x(0) = 0, \mathrm{D}(x)(0) = 0 \tag{17}$$

```
> dsolve({diff(x(t), t$2) + 5·x(t) = 0, ic}, x(t))
```

$$x(t) = 0 \tag{18}$$

```
> dsolve({diff(x(t), t$2) + t·x(t) = 0, ic}, x(t))
```

$$x(t) = 0 \tag{19}$$

```
> dsolve({diff(x(t), t$2) + (t^5)·x(t) = 0, ic}, x(t))
```

$$x(t) = c_1\sqrt{t}\,\mathrm{BesselJ}\left(\frac{1}{7}, \frac{2\,t^{7/2}}{7}\right) \tag{20}$$

```
> ic := x(0) = 0, x(Pi) = 0
```

$$ic := x(0) = 0, x(\pi) = 0 \tag{21}$$

```
> dsolve({diff(x(t), t$2) + x(t) = 0, ic}, x(t))
```

$$x(t) = c_1\sin(t) \tag{22}$$

```
> ic := x(0) = 0, x(1) = 0
```

$$ic := x(0) = 0, x(1) = 0 \tag{23}$$

```
> dsolve({diff(x(t), t$2) + x(t) = 0, ic}, x(t))
```

$$x(t) = 0 \tag{24}$$

```
> ic := x(0) = 0, x(Pi) = 0
```

$$ic := x(0) = 0, x(\pi) = 0 \tag{25}$$

```
> dsolve({diff(x(t), t$2) + x(t) = 1, ic}, x(t))
> dsolve(diff(x(t), t) + x(t) = 15, x(t))
```

$$x(t) = 15 + c_1\,\mathrm{e}^{-t} \tag{26}$$

```
> dsolve(diff(x(t), t) + x(t) = 2·exp(t) − 7·exp(−3 t), x(t))
```

$$x(t) = \frac{7\,\mathrm{e}^{-3t}}{2} + \mathrm{e}^{t} + c_1\,\mathrm{e}^{-t} \tag{27}$$

```
> dsolve(diff(x(t), t) + x(t) = −t^2 + 3·t − 7, x(t))
```

$$x(t) = -t^2 + 5\,t - 12 + c_1\,\mathrm{e}^{-t} \tag{28}$$

```
> dsolve(diff(x(t), t) + x(t) = sin(t), x(t))
```

$$x(t) = -\frac{\cos(t)}{2} + \frac{\sin(t)}{2} + c_1\,\mathrm{e}^{-t} \tag{29}$$

```
> dsolve(diff(x(t), t) + x(t) = 3 cos(t), x(t))
```

$$x(t) = \frac{3\cos(t)}{2} + \frac{3\sin(t)}{2} + c_1\,\mathrm{e}^{-t} \tag{30}$$

```
>
```