p4.9

$$30\,\mathrm{e}^{-2\,t}\,\sin\left(t\right) \tag{1}$$

p3.30

$$\int x dx \tag{2}$$

p4.9

$$A = \begin{pmatrix} \frac{s^2}{2} + \frac{s}{2} + 1 & -\frac{s^2}{2} \\ -\frac{s^2}{2} & \frac{s^2}{2} + \frac{5\,s}{12} \end{pmatrix} \tag{3}$$

$$C = \begin{bmatrix} \frac{11\,(6\,s+5)}{11\,s^2+17\,s+10} + \frac{22\,s}{11\,s^2+17\,s+10} & \frac{66\,s}{11\,s^2+17\,s+10} + \frac{22\left(s^2+s+2\right)}{11\,s^3+17\,s^2+10\,s} \end{bmatrix} \tag{4}$$

$$\begin{pmatrix} 8\,\mathrm{e}^{-\frac{17\,t}{22}}\left(\cos\left(\frac{\sqrt{151}\,t}{22}\right) - \frac{13\,\sqrt{151}\,\sin\left(\frac{\sqrt{151}\,t}{22}\right)}{604}\right) & \frac{18\,\mathrm{e}^{-\frac{17\,t}{22}}\left(\cos\left(\frac{\sqrt{151}\,t}{22}\right) - \frac{139\,\sqrt{151}\,\sin\left(\frac{\sqrt{151}\,t}{22}\right)}{453}\right)}{5} + \frac{22}{5} \end{pmatrix} \tag{5}$$

p3.31

$$1000000\,\mathrm{e}^{-875000\,t}\left(\cosh\left(125000\,\sqrt{33}\,t\right) - \frac{7\,\sqrt{33}\sinh\left(125000\,\sqrt{33}\,t\right)}{33}\right) \tag{6}$$

p4.11

$$\frac{44}{13} - \frac{44\,\mathrm{e}^{-\frac{15\,t}{22}}\left(\cos\left(\frac{\sqrt{1205}\,t}{22}\right) - \frac{89\,\sqrt{1205}\,\sin\left(\frac{\sqrt{1205}\,t}{22}\right)}{1205}\right)}{13} \tag{7}$$

$$\frac{44}{13} - \frac{44\,\mathrm{e}^{-\frac{15\,t}{22}}\left(\cos\left(\frac{\sqrt{1205}\,t}{22}\right) - \frac{89\,\sqrt{1205}\,\sin\left(\frac{\sqrt{1205}\,t}{22}\right)}{1205}\right)}{13} \tag{8}$$

p11

$$\frac{200\,\left(\cosh\left(\frac{t}{4}\right) - \sinh\left(\frac{t}{4}\right)\right)\left(\cosh\left(\frac{\sqrt{3}\,\sqrt{11}\,t}{12}\right) + \frac{\sqrt{3}\,\sqrt{11}\sinh\left(\frac{\sqrt{3}\,\sqrt{11}\,t}{12}\right)}{11}\right)}{3} - \frac{200}{3} \tag{9}$$

$$\frac{400\,s+200}{6\,s^2+3\,s-1} - \frac{200}{3\,s} \tag{10}$$