

Problem 1

In each of Problems 1 through 6, find the Wronskian of the given pair of functions.

$$e^{2t}, \quad e^{-3t/2}$$

Solution

The Wronskian of these two functions is

$$\begin{aligned} W &= \begin{vmatrix} e^{2t} & e^{-3t/2} \\ \frac{d}{dt}(e^{2t}) & \frac{d}{dt}(e^{-3t/2}) \end{vmatrix} \\ &= \begin{vmatrix} e^{2t} & e^{-3t/2} \\ 2e^{2t} & -\frac{3}{2}e^{-3t/2} \end{vmatrix} \\ &= e^{2t} \left(-\frac{3}{2}e^{-3t/2} \right) - e^{-3t/2}(2e^{2t}) \\ &= -\frac{3}{2}e^{t/2} - 2e^{t/2} \\ &= -\frac{7}{2}e^{t/2}. \end{aligned}$$