

Problem 2

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

$$\cos t, \quad \sin t$$

Solution

The Wronskian of these two functions is

$$\begin{aligned} W &= \begin{vmatrix} \cos t & \sin t \\ \frac{d}{dt}(\cos t) & \frac{d}{dt}(\sin t) \end{vmatrix} \\ &= \begin{vmatrix} \cos t & \sin t \\ -\sin t & \cos t \end{vmatrix} \\ &= \cos t(\cos t) - \sin t(-\sin t) \\ &= \cos^2 t + \sin^2 t \\ &= 1. \end{aligned}$$