

3450:335 Ordinary Differential Equations, Kreider

Name: _____

Quiz 1, Section 1.2, due on _____

(10 pts) The two parameter family of solutions $y(x) = c_1 \sin \sqrt{7}x + c_2 \cos \sqrt{7}x$ satisfies the differential equation $y'' + 7y = 0$. Find the member of the family that satisfies the initial conditions $y(0) = 5$ and $y'(0) = -\sqrt{7}$. To apply the second initial condition, evaluate $y'(x)$, then let $x = 0$.

$$y(0) = 5 = c_1 \sin 0 + c_2 \cos 0 = c_2$$

$$c_2 = 5$$

$$y'(x) = c_1 \sqrt{7} \cos \sqrt{7}x - c_2 \sqrt{7} \sin \sqrt{7}x$$

$$y'(0) = -\sqrt{7} = c_1 \sqrt{7} - 0$$

$$c_1 = -1$$

$$y(x) = -\sin \sqrt{7}x + 5 \cos \sqrt{7}x$$