Homework No. 6

1. Problems 5.5 (modified).

(a) Compute the root-mean-square (rms) errors for $\alpha = 1$, $u = v = 1$ using $6 \times 6$, $11 \times 11$, and $21 \times 21$ grids with $\phi = 0$ as initial guess.

(b) Compute the rms error for $\alpha = 1$, $u = 5$ and $v = 10$ using $21 \times 21$ grid and $\phi = 0$ as initial guess.

(c) Compute the rms error for $\alpha = 1$, $u = 100$ and $v = 30$ using $21 \times 21$ grid and $\phi = 0$ as initial guess. If necessary, use under-relaxation to ensure convergence.

Note: the exact solution remains the same for arbitrary $u$ and $v$: $\bar{\phi} = (\sin \theta) / r$

Due Monday 11/12/2018