EE331 — Homework #7 / Due Wednesday, Mar. 4, 2020, **at the beginning of class**

1. A vector field is given by $\mathbf{E} = 5xy\,\hat{\mathbf{a}}_x + 6(x^2 + 3)\,\hat{\mathbf{a}}_y + 8z^2\,\hat{\mathbf{a}}_z$ V/m. Find (a) the magnitude of $\mathbf{E}$ in the $y = 0$ plane, (b) the value of $\mathbf{E}$ at $\mathbf{r}(1, 1, 1)$ m, (c) the vector component of $\mathbf{E}$ parallel to the y axis. (d) Find the value of $\mathbf{E}$ along the line $(0, 10, z)$ and plot its *magnitude* for $-3 \le z \le 3$. Be sure to label your axes.

2. (a) Ch. 2, Prob. 2.7(b), (b) convert $\mathbf{G} = \rho\sin\phi\,\hat{\mathbf{a}}_\rho - \rho\cos\phi\,\hat{\mathbf{a}}_\phi + \rho\,\hat{\mathbf{a}}_z$ to rectangular coordinates, and (c) convert $\mathbf{H} = \cos\theta\,\hat{\mathbf{a}}_r + \sin\theta\,\hat{\mathbf{a}}_\theta$ to rectangular coordinates. **Use the projection method to do these**.

3. Ch. 2, Prob. 2.24(b)&(c).