Name: _____
ID #: _____

Physics 222 - Spring 2020
★ Homework 3 ★
Chapter 15

1) Extending upon the derivation of a ring of mass via integrating the gravitational potential, calculate the gravitational field a distance, z, above an infinite plane of mass surface density, σ.
Hint 1: think about how to extend the limits of integration to turn a ring solution into an infinite plane solution;
Hint 2: only changes in potential are meaningful, so think about where to set the 'zero of the potential'.

2) Use Gauss' law to repeat the calculation of the gravitational field a height, z, above the same infinite sheet from problem 1). Confirm that the answers are identical.

3) 15.2
4) 15.3
5) 15.6
6) 15.8
7) 15.10
8) 15.11
9) 15.14