Geophysics 150: Home set due Nov. 8, 2000

1. The objective of this problem is to see what corrections to gravity data do and not do.   A measurement has been taken at 240 m elevation at latitude 38.5 degrees north. It is recorded in the note book that the Bouguer anomaly is 35.4 mgals and that a density of 2.67 g/cc was used to compute it.

a. Compute the observed gravity at the site. Use 1967 formula on page 90 of book.

b. What is the free air anomaly at the site.

c. You return to the site a year later. You find that a lava flow that is 20 m thick has covered the old site but that you are able to measure directly over the old site. The lava flow is a uniform density and thickness sheet with a density a 2.30 g/cc. Obtain the new observed gravity at the site assuming that the rest of the Earth has no local mass variations so you need to worry about only the mass of the lava flow and about being further from the center of the Earth.