

ES734/834: HOUR EXAM IV, 2004

Do #1, 2 and 3 Plus Two Others

1. Compare and contrast gravity, seismic refraction and seismic reflections as methods to find the base (bottom contact) of the Exeter pluton.
2. Define Free Air and Simple Bouguer anomalies. Explain the physical significance of each term in the definitions. Clearly state all units of measurement.
3. Set up an integral to determine the gravitational effect of a thin vertical cylinder. You do not have to evaluate the integral.
4. Describe three ways (procedures, algorithms) to separate residual and regional gravity fields.
5. With clear figures explain the advantages and disadvantages of gravity gradient anomalies as compared to gravity anomalies.
6. The gravitational acceleration on the surface of the moon is 163000 milligals and the mean density is 3340 kg/m^3 . The universal gravitational constant is $6.67 \times 10^{-11} \text{ (m}^3\text{)/(kg s}^2\text{)}$. What is the radius of the moon in km? You don't need to do the arithmetic. Just work out the correct expression and check the units.
7. Explain why a geophysicist should understand differential and integral calculus. Include specific examples of each.