

3. Find the acceleration of gravity  $\vec{g}$  for the following mass distribution. The mass distribution consists of an infinitely long "wire" of radius *a* running along the *z* axis, surrounded by empty space then by a hollow cylinder with inner radius *b* and outer radius *c*, also centered on the *z* axis. Both the inner wire and the outer cylinder have density  $\rho$ . In effect this looks like a coaxial cable oriented along the *z* axis. Be sure to describe the direction as well as the magnitude of  $\vec{g}$  in all of the different regions: within the inner wire, between it and the hollow cylinder, within the cylinder, and outside the cylinder.

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