1. p. 431, 8.156
2. p. 437, 8.170
3. p. 444, 8.188
4. If \( \mathbf{r} \) is the position vector, verify that \( \nabla \cdot \mathbf{r} = 3 \) by using the spherical polar coordinate system.
5. Laplace’s equation, very commonly used in many areas of physics, is:
   \[
   \nabla^2 V = 0
   \]
   where \( V \) is some scalar potential. Suppose the potential function depends only on \( r \) and has the form:
   \[
   V = c r^n
   \]
   where \( c \) is a constant. For what values of \( n \) will \( V \) satisfy Laplace’s equation?
6. p. 657, 12.16