21-259 Formula Sheet for Test 3:

- Change of variables:
  - Polar Coordinates in 2D: $x = r\cos\theta, \quad y = r\sin\theta, \quad |J| = r.$
  - Cylindrical Coordinates in 3D: $x = r\cos\theta, \quad y = r\sin\theta, \quad z = z, \quad |J| = r.$
  - Spherical Coordinates in 3D:
    : $x = \rho\sin\varphi\cos\theta, \quad y = \rho\sin\varphi\sin\theta, \quad z = \rho\cos\varphi, \quad |J| = \rho^2\sin\varphi.$