convert is the function $\frac{q}{r+1}$. In the question, r is used as the coordinate for the length of the cylinder. To avoid confusion with the radial coordinate in the polar coordinates, we will rename it l, so the function becomes $\frac{q}{l+1}$. Now $q = r\cos\theta$, where r is now the radial coordinate. In polar coordinates, the function is now $\frac{r\cos\theta}{l+1}$.

Putting this all together, the volume is

$$\int_0^7\int_0^2\int_0^{\pi/2}\frac{r\cos\theta}{l+1}\,r\,d\theta\,dr\,dl = \int_0^7\int_0^2 \frac{r^2}{l+1}\left[\sin\theta\right]_0^{\pi/2}dr\,dl$$

$$= \int_0^7\int_0^2\frac{r^2}{l+1}\,dr\,dl = \int_0^7\frac{1}{l+1}\left[\tfrac{1}{3}r^3\right]_0^2 dl = \int_0^7\frac{1}{l+1}\,\frac{8}{3}\,dl = \frac{8}{3}\left[\log_e(l+1)\right]_0^7$$

$$= \frac{8}{3}\log_e 8$$

Volume of the region is $\frac{8}{3}\log_e 8$