I) $d \ll r$ $\quad \emptyset(r,\theta,t) = \frac{1}{4\pi\varepsilon_0}\left\{ \frac{q_0 \cos\left(\omega\left(t+\frac{r_+}{c}\right)\right)}{r_+} - \frac{q_0 \cos\left(\omega\left(t+\frac{r_-}{c}\right)\right)}{r_-} \right\}$

$$\cos\left(\omega\left(t+\frac{r_+}{c}\right)\right) = \cos\left(\omega\left(t+\frac{r}{c}\left(1-\frac{d\cos\theta}{2r}\right)\right)\right) = \cos\left(\omega t + \frac{\omega r}{c} - \frac{r\omega\, d\cos\theta}{c\, 2\, r}\right) = \quad (2)$$

$$= \cos\left[\omega\left(t+\frac{r}{c}\right) + \left(\frac{\omega}{c}\,\frac{d}{2}\cos\theta\right)\right]$$

use sum identities ✳✳

$$= \cos\left[\omega\left(t+\frac{r}{c}\right)\right]\cos\left[\frac{\omega}{c}\,\frac{d}{2}\cos\theta\right] - \sin\left[\omega\left(t+\frac{r}{c}\right)\right]\sin\left[\frac{\omega}{c}\,\frac{d}{2}\cos\theta\right]$$

✳✳ $\cos(a+b) = \cos a \cos b - \sin a \sin b$