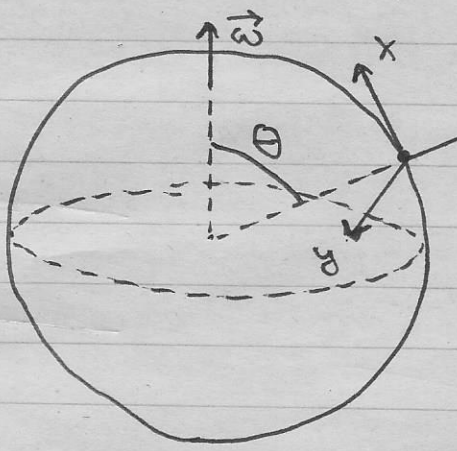
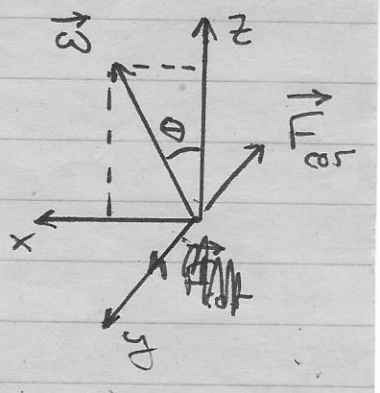
9.9 Bullet mass m, fired North with speed V_0 at colatitude θ.

Earth:



frame S (x is North, y is west



bullet velocity $\dot{\vec{r}} = (V_0, 0, 0)$

$\vec{\omega} = (\omega\sin\theta, 0, \omega\cos\theta)$

$$\therefore \vec{F}_{cor} = 2m\dot{\vec{r}} \times \vec{\omega} = 2m(V_0, 0, 0) \times (\omega\sin\theta, 0, \omega\cos\theta)$$

$$= -2m\omega V_0 \cos\theta\, \hat{j} \quad (\text{East}\ \cancel{\text{westward}})$$

So $\vec{F}_{cor}$ is to the West, with magnitude $\boxed{2m\omega V_0\cos\theta}$.

Relative to bullet's weight if $V_0 = 1000\,m/s$, $\theta = 40^\circ$:

$$\frac{F_{cor}}{mg} = \frac{2m\omega V_0\cos\theta}{mg} = \frac{2\omega V_0\cos\theta}{g}$$

$$= \frac{2\left(\frac{2\pi}{86400}\right)(1000)\cos 40^\circ}{9.8} \approx 0.011 = \boxed{1.1\%}$$