Worksheet rotation: angular conservation

**1.** You are spinning in a chair with hands outstretched. You then quickly pull your hands close to your chest.

**a)** Has your inertia increased, decreased, or remained constant?

**b)**  Has your angular momentum increased, decreased, or remained constant?

**2.** At time $t=0s,$ a 2.75kg air pocket fluctuation of sound, dust, and musical energy has a position vector $\vec{r}=7m\hat{i}-2m\hat{j}$ relative to the vocaloid projector emitting it. The air pocket fluctuation travels around the vocaloid source on its musical trajectory with a linear velocity of $\vec{v}=\left(-1.76t^{2}\right)\hat{i}$ , t being in seconds. Hint, $\vec{r}$ happens to simultaneously be your lever arm and radius of the emitted sound’s region.

**a)** When $t=10.8s,$ what is the air pocket fluctuation's angular momentum?

**b)** When $t=10.8s,$ what is the torque musically acting on the air particle's fluctuation?