$$\tau_{req} = mgr\sin\theta \;;\; \text{max occurs at } 90° \approx \sin\theta = 1$$

$$\tau_{req} = mgr$$

Note: largest dino $= 0.7\,kg$, $r \approx 20\,cm$

$$\tau_{req} = 0.7(9.8)(0.2) = 1.372\; N\cdot m$$

Note: each servo has $0.46\,N\cdot m$ torque

→2 servos will be used at base so, $0.686\; N\cdot m$ /servo is required

→ implement a gear ratio we know

$$\tau_{output} = GT \geq mgr$$

$$G(0.686) \geq 1.372$$

$$G \geq 2$$

∴ each motor require a 2:1 gear ratio
which can be accomplished with
a 10 and 20 tooth gearbox.