

ASTR 425/525 Cosmology

Worksheet #8
Monday 09/15/2025

Question 1.

In this question, we consider a flat matter-dominated Universe ($\Omega_m = 1$) with Hubble constant H_0 .

- (a) Compute the angular diameter distance to redshift z .
- (b) Show that the angular diameter distance reaches a maximum. At what redshift z_{max} is this maximum reached?
- (c) What does this imply for the angular size $\theta(z)$ of an object of fixed physical size l placed at redshift z ? Sketch $\theta(z)$. What does this tell you about the physical meaning of the angular diameter distance?

