ratios results in

$$\frac{b_A}{b_\odot} = \frac{4/81}{(1/2)^2} = \frac{4/81}{1/4} = \frac{16}{81}$$

Algebra Flashback! The last step uses simplification of compound fractions:

$$\frac{a/b}{c/d} = \frac{a}{b} \div \frac{c}{d} = \frac{a}{b} \cdot \frac{d}{c}$$

How big does the Son look from Astra, compared to our Sun from here (compare their angular diameters)?

"Compare their angular diameters" is as clear a message to use a ratio as any. The angular diameter formula is given by:

$$\theta \propto \frac{R}{d}$$

where θ is the angular size that we're looking for, R is the radius (size) of the object and d is how far away the object is from us. We need to set up a ratio again:

$$\frac{\theta_A}{\theta_\odot} = \frac{R_A/R_\odot}{d_A/d_\odot}$$

Both of the ratios we need were used earlier. Problem 3 tells us that $R_A/R_\odot = 1/2$, and $d_A/d_\odot = 1/2$ was deduced earlier in this problem. Thus,

$$\frac{\theta_A}{\theta_\odot} = \frac{1/2}{1/2} = 1$$

Thus, the angular sizs of the two stars are equal *i.e.* they take us the same space on the sky!