

Answers to 2008 Mock Final

Problems

1(a) $1.1 \times 10^7 \text{ km} = 0.073 \text{ AU}$

(b) $1.4 \times 10^6 \text{ kg m}^{-3}$

(c) $1.9 \times 10^{-5} \text{ arcsec}$

(d) 250 arcsec

(e) $5.2 \times 10^6 \text{ m s}^{-1}$

(f) $2.2 \times 10^7 \text{ s} = 250 \text{ days}$

2(a) 25.3 cm

(b) $60 \text{ km s}^{-1} \text{ Mpc}^{-1}$

(c) $6.8 \times 10^{-27} \text{ kg m}^{-3}$

(d) 4.9×10^{-2}

(e) Universe will expand forever and ever to Big Freeze

(f) Distances then are 0.8 times distance today.

(g) Density then is 1.7 times density today.

3(a) 14 years

(b) 99 light years

(c) 14 light years

4(a) $8.1 \times 10^8 \text{ years}$

(b) $5.1 \times 10^{17} \text{ s} = 16 \text{ billion years}$

Multiple Choice

1) b

2) c

3) a

4) c

5) b

6) c

7) c

8) b

9) d