Question 1:

- Astronomical unit (AU) - average distance between earth and the Sun.

$$1AU = 1.496 \times 10^8$$

(to 4 s.f)

- Solar radius ($R_\odot$)

$$1R_\odot = 6.955 \times 10^5 \,\text{km}$$

(to 4 s.f) $\odot$ is used to notate quantities related to the Sun.

- Light-year (ly), distance light travels in a year through empty space.

$$1ly = 9.461 \times 10^{12} \,\text{km}$$

(to 4s.f)

- Parsec (pc)

$$1pc = 3.086 \times 10^{13} \,\text{km}$$
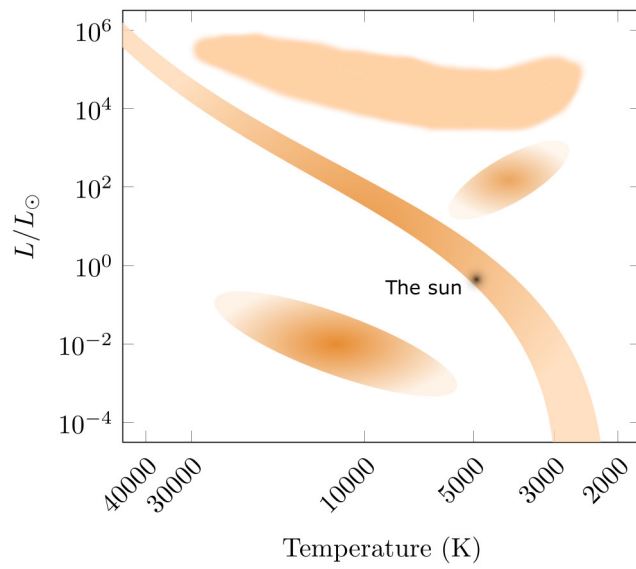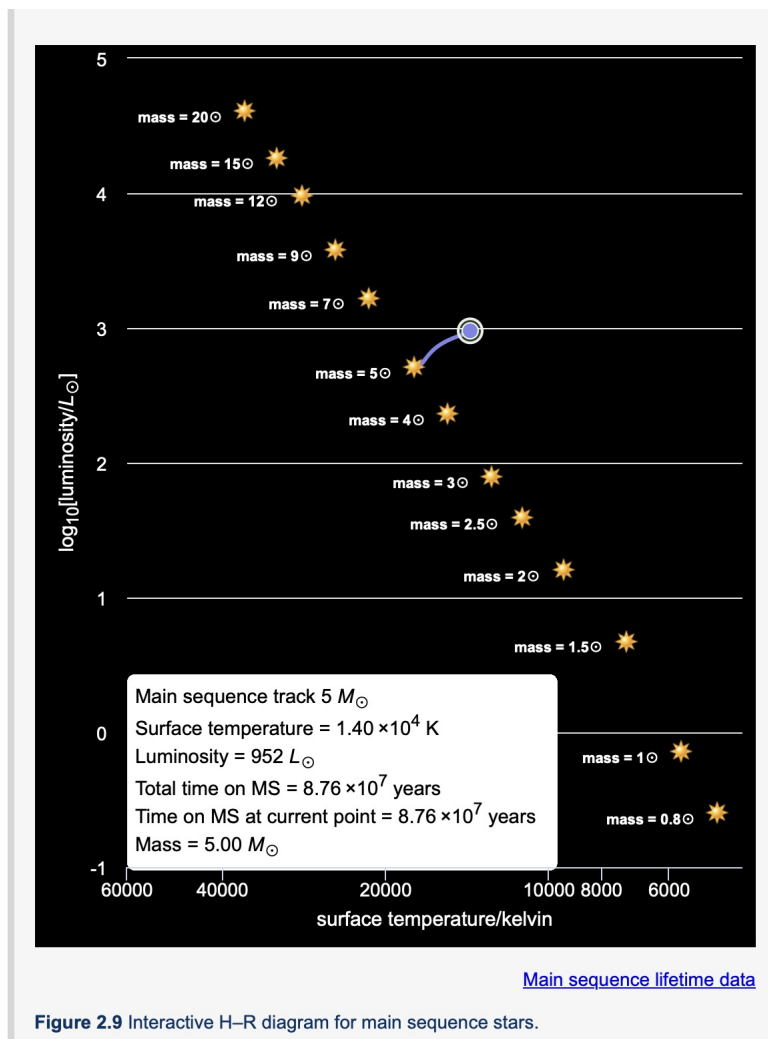
(to 4s.f)

- kilo $= 10^3$

- mega $= 10^6$

- giga $= 10^9$

About 5 mins to read and make notes.

Question 2:

$$\theta^2 = (\Delta\alpha)^2(\cos\delta)^2 + (\Delta\delta)^2$$

Question 2:

Question 3:

Part (a):

Part (b):

Part (c):

Figure 2.9 Interactive H–R diagram for main sequence stars.

Investigating the properties of stars on the main sequence, Copyright © 2023, The Open University, Available at: `https://learn2. open.ac.uk/mod/oucontent/view.php?id=2288312& section=2.2.1` (13/10/24)

Question 4:

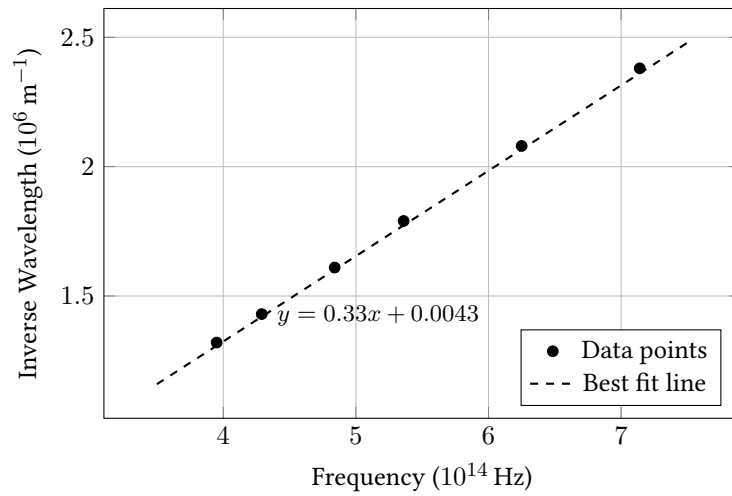| Star	Apparent magnitude(m)	Distance (d/pc)
Alpha Cygni	1.25	800
Beta Cygni	2.93	130
Gamma Cygni	2.23	560
Delta Cygni	2.87	51
Epsilon Cygni	2.48	22

Question 5:

Figure 1: Plot of inverse wavelength versus frequency with a best fit line

$paulallen@Pauls-AirTMA00$
$python3line_of_best_fit.py$
$Slope: 0.3325256100466257$
$Intercept: 0.004284972035984325$

$$c = \lambda f$$
$$f = \frac{c}{\lambda}$$
$$\frac{1}{\lambda} = \frac{f}{c} \qquad (1)$$

Using;

$$c \approx \frac{1}{gradient} \approx 3.01 \times 10^8 \,\mathrm{m\,s^{-1}}$$