

## Chapter 3 Self Test

The following questions all refer to graphs in Chapter 3; they are referenced by the paragraph number (e.g., [10]) in which they appear.

1. In [10], what is the range of brightness values consistent with the measured point at a frequency of 0.6 GHz? Which experiment measured a value of the brightness at the same frequency used by the discoverers of this radiation, Penzias and Wilson?
2. Assuming that there is a positive linear relationship within the data of figure [44], which point would you consider an outlier from this trend?
3. In [52], figure 19, which is the steeper approach to Pike's Peak, from A or from B?
4. In [60], figure 24, which is warmer on average, the North Atlantic or South Atlantic? What is the water temperature at 140° West longitude, 40° North latitude in July?
5. In [62], figure 26, are there any objects lying outside the dashed box whose limits are consistent with them being inside the box?
6. In [67], figure 28, what is the approximate uncertainty in the position of the giant black hole at the center of our Galaxy?
7. In [70], the link "here", what is the value of  $S_\nu$  at  $\log(\nu) = 10$ . Which flux upper limits are consistent with the spectrum running flat across the graph at  $\log(S_\nu) = 0$ ?
8. In [77], which represents a quasar putting out more energy, one at "dereddened absolute K magnitude" of  $-30$  or of  $-32$ ? What is the maximum redshift at which we could detect a  $K = -30$  quasar with a reddening of  $E(B - V) = 0.75$ ?

### Answers

1. 2 to  $5 \times 10^{-19}$  erg cm<sup>-2</sup> s<sup>-1</sup> Hz<sup>-1</sup> sr<sup>-1</sup>; LBL - Italy.
2. The one at 32 yrs and 25 m<sup>2</sup>.
3. From A.
4. The North Atlantic; between 16° and 18° Celsius.
5. No.
6. About  $\pm 0.01''$  in each coordinate.

7. 1 Jy; the two points between  $\log(\nu) = 12$  and 13.

8. -32; about redshift 1.2.