

## Exercise

- 5.1** With reference to Figures 5.1-5.14, note significant differences between the Northern and Southern Hemispheres. Comment on these differences where possible. Pay particular attention to Figure 5.12. Comment on the different patterns of seasonality.
- 5.2** In order to study the relative roles of eddy amplitude and mean flow intensity in determining whether or not the eddies will produce closed streamline contours, consider the following simple expression for the superposition of a simple eddy and a mean zonal flow:

$$\Phi(x, y) = Ay + B \sin(kx) \sin(ly)$$

Let  $k = 2\pi/7000\text{km}$ ,  $l = \pi/5000\text{km}$ . Use some program to plot contours of constant  $F$ , and play with values of  $A$  and  $B$  to see when you get opened and closed contours. Try to choose  $A$  and  $B$  to reproduce what is seen in maps for 500mb.

- 5.3** Using figure 5.11, plot the distribution of  $T$  with latitude for the 1000, 700, 500 and 300mb pressure levels during December-February and June-August. Note the Equator-to-Pole temperature difference at each level for Northern and Southern Hemisphere in Winter and Summer.