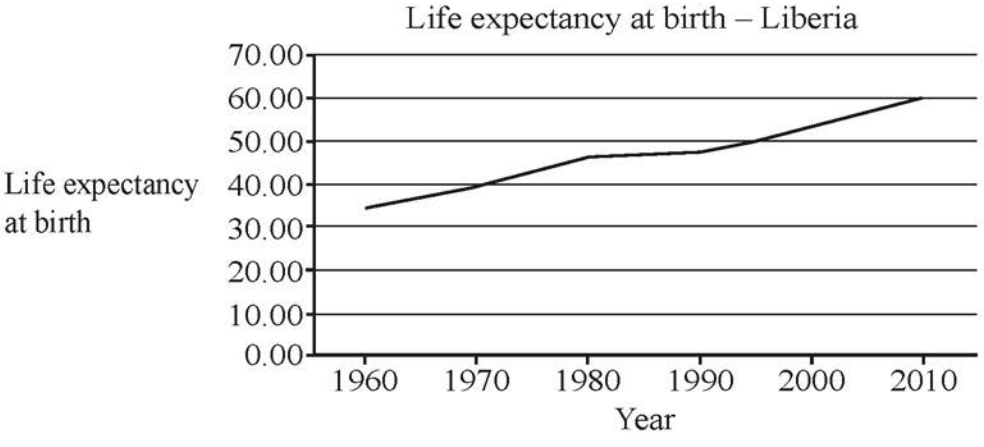
15 The pre-release material includes information on life expectancy at birth in countries of the world. **Fig. 15.1** shows the data for Liberia, which is in Africa, together with a time series graph.



1960	1970	1980	1990	2000	2010
34.67	39.25	46.00	47.18	52.42	59.63

Fig. 15.1

Sundip uses the LINEST function on a spreadsheet to model life expectancy as a function of calendar year by a straight line.

The equation of this line is $L = 0.473y - 892$, where L is life expectancy at birth and y is calendar year.

(a) Use this model to find an estimate of the life expectancy at birth in Liberia in 1995. **[1]**

According to the model, the life expectancy at birth in Liberia in 2025 is estimated to be 65.83 years.

(b) Explain whether each of these two estimates is likely to be reliable. **[2]**

(c) Use your knowledge of the pre-release material to explain whether this model could be used to obtain a reliable estimate of the life expectancy at birth in other countries in 1995. **[1]**

Fig. 15.2 shows the life expectancy at birth between 1960 and 2010 for Italy and South Africa.

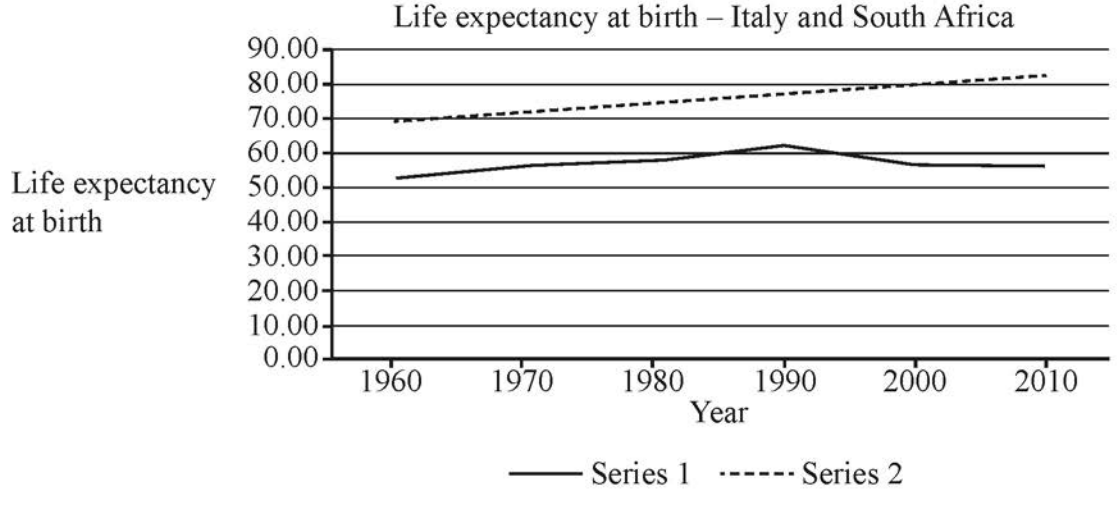


Fig. 15.2

(d) Use your knowledge of the pre-release material to

- Explain whether series 1 or series 2 represents the data for Italy.
- Explain how the data for South Africa differs from the data for most developed countries.

[2]

Sundip is investigating whether there is an association between the wealth of a country and life expectancy at birth in that country. As part of her analysis she draws a scatter diagram of GDP per capita in US $ and life expectancy at birth in 2010 for all the countries in Europe for which data is available. She accidentally includes the data for the Central African Republic. The diagram is shown in **Fig. 15.3**.

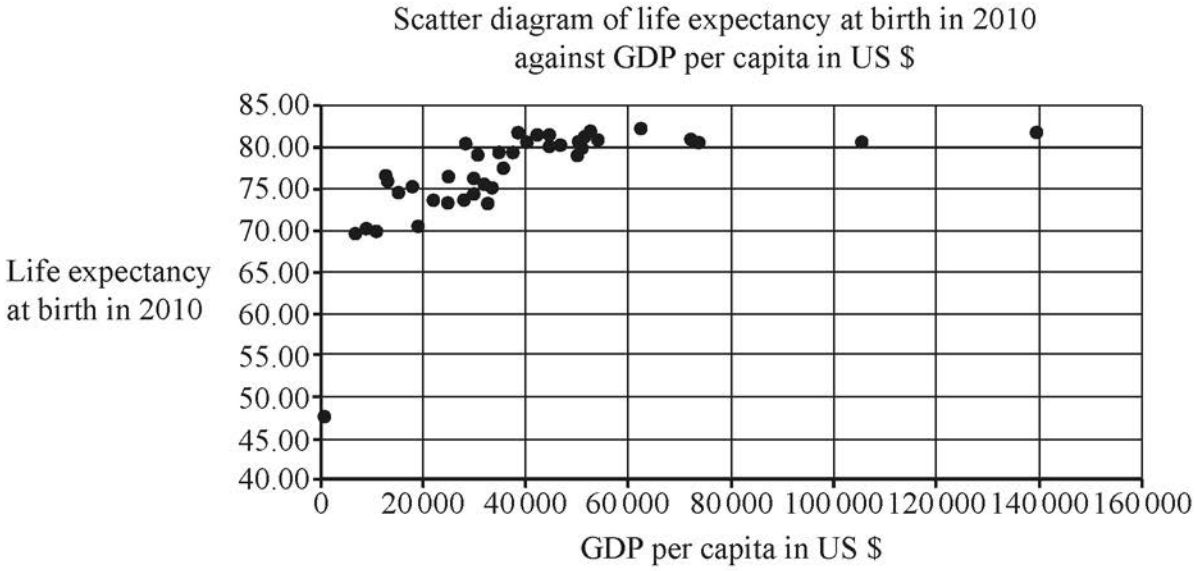


Fig. 15.3

(e) On the copy of **Fig. 15.3** in the Printed Answer Booklet, use your knowledge of the pre-release material to circle the point representing the data for the Central African Republic. **[1]**

Sundip states that as GDP per capita increases, life expectancy at birth increases.

(f) Explain to what extent the information in **Fig. 15.3** supports Sundip's statement. **[2]**