8.1

thousands

	UK workforce in employment	Trade union membership
1993	25,360	8,700
1994	25,517	8,278
1995	25,800	8,089
1996	26,034	7980
1997	26,507	7835

Source: Annual Abstract of Statistics

Construct a simple index for each series with 1993 = 100 and comment on any points of interest.

8.1

Year	UK employment	Trade Union membership
1993	100	100
1994	$\frac{25517}{25360}\times 100 = 100.6$	$\frac{82787}{87000}\times 100 = 95.1$
1995	101.7	93.0
1996	102.7	91.7
1997	104.5	90.1

8.2

In 1990, Lord Blandings opened his gardens to the public.
Table 1 shows the annual totals of visits to Blandings since then.
Table 2 shows an index of UK trends in numbers of visits to gardens over the same period.

Table 1 Visits to Blandings

Year	No. of visits
1990	32,800
1991	36,700
1992	35,800
1993	38,100
1994	40,700
1995	42,600

Table 2 UK trends in visits to gardens

Year	Index of visits (1985=100)
1990	133.6
1991	140.3
1992	140.3
1993	148.6
1994	155.5
1995	163.0

Source: Annual Abstract of Statistics

(i) Construct a simple index of visits to Blandings with 1990=100.

(ii) Rebase the UK index of visits to gardens to 1990=100.
Hence, advise Lord Blandings on his performance compared with the 'industry'.

8.2

Year	Visits to Blandings	UK visits to Gardens
1990	100	$\frac{133.6}{133.6}\times 100 = 100$
1991	$\frac{36700}{32800}\times 100 = 111.9$	$\frac{140.3}{133.6}\times 100 = 105.0$
1992	109.1	105.0
1993	116.2	112.0
1994	124.1	116.4
1995	129.9	122.0

8.3

	Retail Prices Index (RPI)	
Date	Jan. 1974=100	Jan. 1987=100
Jan. 1982	310.6	
Jan. 1983	325.9	
Jan. 1984	342.5	
Jan. 1985	359.8	
Jan. 1986	379.7	
Jan. 1987	394.5	100
Jan. 1988		103.3
Jan. 1989		111.0

Source: Annual Abstract of Statistics

$$\frac{325{,}9-310{,}6}{310{,}6}\cdot 100 = +4{,}9\%$$

$$\frac{394{,}5-310{,}6}{310{,}6}\cdot 100 = +27{,}0\%$$

$$\frac{154{,}4-78{,}7}{78{,}7}\cdot 100 = +96{,}2\%$$

8.4

International tourism

Year	Overseas residents: Visits to UK (thousands)	Overseas residents: Spending in UK (£millions)	UK residents: Visits overseas (thousands)	UK residents: Spending overseas (£millions)	All items RPI (Jan 87 = 100)
1992	18,535	7,891	33,836	11,243	138.5
1993	19,863	9,487	36,720	12,972	140.7
1994	20,794	9,786	39,630	14,365	144.1
1995	23,537	11,763	41,345	15,386	149.1
1996	25,293	12,369	42,569	16,310	152.7

Source: Annual Abstract of Statistics

(i) Use the RPI to deflate the spending by tourists to and from the UK to constant 1992 prices.

(ii) Hence find the average expenditures per trip at constant prices for tourists to and from the UK. Comment on your results.

8.4

Year	Spending overseas £millions	Spending overseas at 1992 prices (£millions)	All items RPI (Jan 87 = 100)
1992	11,243	11,243	138.5
1993	12,972	12,769	140.7
1994	14,365	13,807	144.1
1995	15,386	14,292	149.1
1996	16,310	14,793	152.7

$\frac{12972}{140.7} \times 138.5 = 12769.2$

$\frac{14365}{144.1} \times 138.5 = 13807$

8.4

Year	Visits overseas thousands	Spending overseas at 1992 prices (£millions)	Average spending per visit at constant 1992 prices £ per visit
1992	33,836	11,243	$\frac{11243 \times 1000000}{33836 \times 1000} = 332$
1993	36,720	12,769	$\frac{9339 \times 1000000}{19863 \times 1000} = 348$
1994	39,630	13,807	348
1995	41,345	14,292	346
1996	42,569	14,793	348

8.5

8.5 The table shows the prices (£ per tonne) and quantities sold ('000 tonnes) of a group of cereal crops.

	1994		1995	
	p_0	q_0	p_n	q_n
Wheat	106	4,000	116	4,400
Barley	105	3,200	108	3,800
Oats	108	200	101	200

(a) Calculate a Laspeyres index for 1995 with 1994 as the base year.

(b) Calculate the corresponding Paasche index for 1995.

(c) Calculate the price relative ($p_n \div p_0$) for each individual cereal. Why does the significant fall in the price of oats have little effect on the compound index numbers calculated in (a) and (b)?

8.5

$$L = \frac{\sum p_n q_0}{\sum p_0 q_0} \times 100$$

So applying this to the table of data with n referring to 1995 and 0 referring to 1994 we obtain the Laspeyres index for 1995:

$$L = \frac{116 \times 4000 + 108 \times 3200 + 101 \times 200}{106 \times 4000 + 105 \times 3200 + 108 \times 200} \times 100 = \frac{829800}{781600} \times 100 = 106.2$$

$$P = \frac{\sum p_n q_n}{\sum p_0 q_n} \times 100$$

$$P = \frac{116 \times 4400 + 108 \times 3800 + 101 \times 200}{106 \times 4400 + 105 \times 3800 + 108 \times 200} \times 100 = \frac{941000}{887000} \times 100 = 106.1$$

8.5

This is given by $\frac{p_n}{p_0}$ and the results for each cereal are shown below.

Wheat: $\frac{116}{106} = 1.094$ i.e. price rose by 9.4%

Barley: $\frac{108}{105} = 1.029$ i.e. price rose by 2.9%

Oats: $\frac{101}{108} = 0.935$ i.e. price fell by 6.5%

8.6

	All items RPI (13 Jan '87 =100) Annual averages
1994	144.1
1995	149.1
1996	152.7
1997	157.5
1998	162.9

This is just too easy!

By constructing a chain index, find the annual inflation rate for 1995 to 1998.

8.7

8.7 The table shows the average market prices (£ per tonne) and total quantities sold ('000 tonnes) of two related fruits.

	1995		1996		1997	
	p_0	q_0	p_n	q_n	p_n	q_n
Desert apples	465.7	138.5	474.7	105.4	538.1	96.0
Pears	447.5	29.7	441.7	35.8	433.1	33.0

(a) Calculate a Laspeyres index for 1996 and 1997 with 1994 as the base year.

(b) Calculate the corresponding Paasche indices for 1996 and 1997.

(c) Suggest reasons why there is such a large difference between the Laspeyres index and the corresponding Paasche index for 1997.

8.7

$$L = \frac{\sum p_n q_0}{\sum p_0 q_0} \times 100$$

1996 Index

$$L = \frac{474.7 \times 138.5 + 441.7 \times 29.7}{465.7 \times 138.5 + 447.5 \times 29.7} \times 100 = \frac{78864.44}{77790.2} \times 100 = 101.4$$

$$P = \frac{\sum p_n q_n}{\sum p_0 q_n} \times 100$$

1996 Index

$$P = \frac{474.7 \times 105.4 + 441.7 \times 35.8}{465.7 \times 105.4 + 447.5 \times 35.8} \times 100 = \frac{65846.24}{65105.28} \times 100 = 101.1$$