

The screenshot displays a test interface with a bar chart and a question. The bar chart, titled "European Inflation Indices for 1994 (Indexed to 100 at 1st Quarter)", shows inflation rates for four countries (Spain, Italy, Netherlands, France) across four quarters (Q1, Q2, Q3, Q4). The y-axis represents the index value from 0 to 120. The x-axis lists the countries and quarters. The data is as follows:

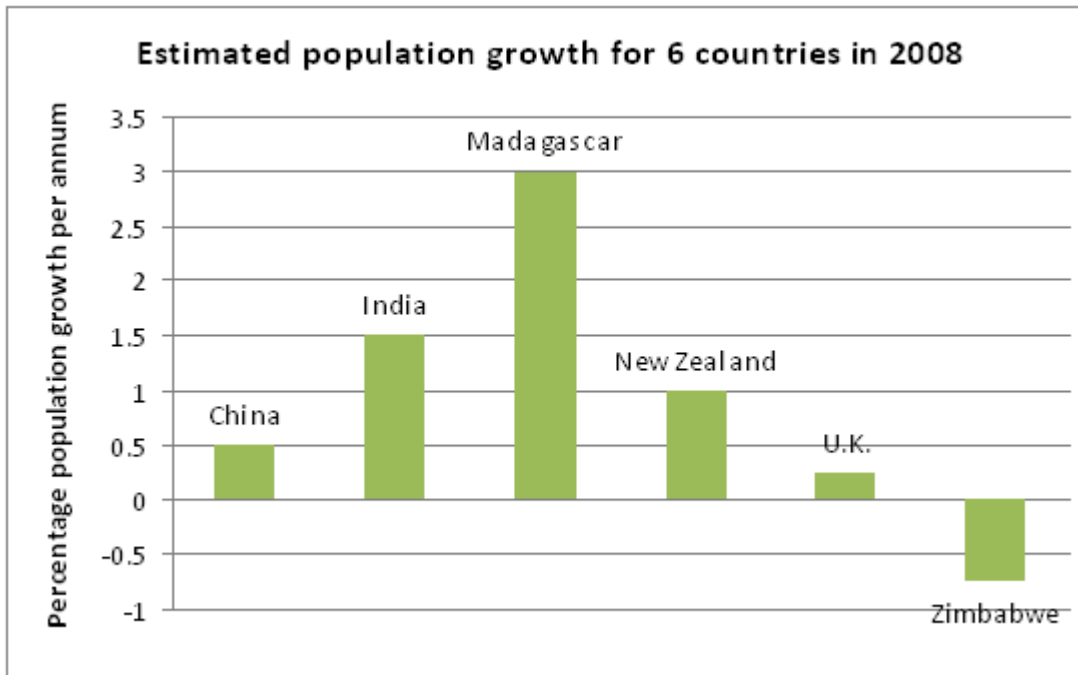
Country	Q1	Q2	Q3	Q4
Spain	100	105	110	115
Italy	100	102	104	106
Netherlands	100	101	102	103
France	100	100	100	100

Question 2: The average index level (averaging 100) of all four countries has risen with respect to the 1st quarter. How many of the countries have risen with respect to the 1st quarter?

Options:
 A) 1
 B) 2
 C) 3
 D) 4

Numerical Reasoning Practice Test 7

Solution Booklet



Q1 Which country from the six countries surveyed had the highest population in 2008?

- China Madagascar U.K. **Cannot say**

*This is a good example of why it is important to carefully read the graph. Although it is well known that China is the most populous country in the world, the graph shows population **growth**, not population size. Madagascar has the highest growth, but this also tells us nothing about the actual population. Based on information from the graph, we cannot say which country has the highest population.*

Q2 From the estimated figures for 2008, approximately by how much did Madagascar's growth rate exceed Zimbabwe's growth rate?

- 3.75%** 3.25% 3.0% 2.25%

From the graph, Madagascar's growth rate was 3.0% and Zimbabwe's was about -0.75%. (That's a negative growth.) So $3.0\% - (-0.75\%) = 3.0\% + 0.75\% \approx 3.75\%$.

Q3 The population of India was 1.15 billion in 2008. Assuming the growth rate for India remains unchanged, approximately how many more years (after 2008) will pass before India's population exceeds 1.2 billion?

1

2

3

4

The population growth for India is 1.5%. Each successive year's figure, therefore, is obtained by multiplying by 101.5%, or 1.015.

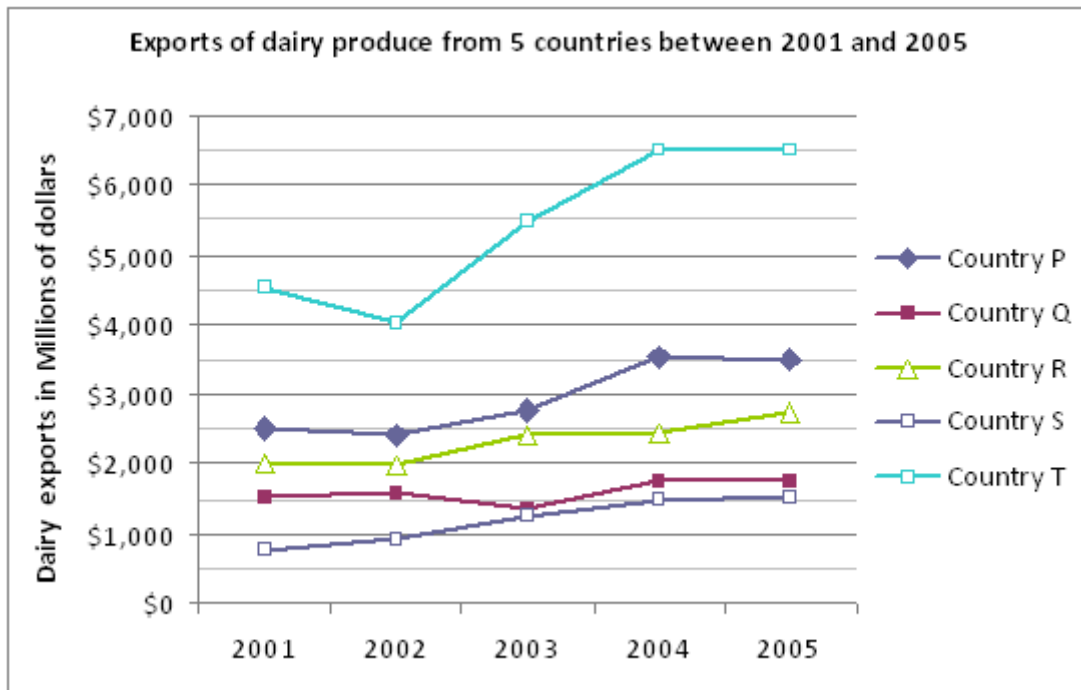
∴ Estimated population in:

$$2009 = 1.15 \times 1.015 = 1.1673 \text{ billion}$$

$$2010 = 1.1673 \times 1.015 = 1.1848 \text{ billion}$$

$$2011 = 1.1848 \times 1.015 = 1.2025 \text{ billion}$$

∴ Approximately three more years will pass before India's population exceeds 1.2 billion. Note the question asks for approximate number of years and the options given are all integers, so there is no need to calculate the answer in any more detail than this.



Q4 Approximately what percentage of the combined exports of dairy products for all five countries in 2004 was attributable to Country T?

- 30% **40%** 50% 60%

In billions of dollars, the approximate amounts for each country in 2004 were:

- Country P 3.5 billion
- Country Q 1.75 billion
- Country R 2.75 billion
- Country S 1.5 billion
- Country T 6.5 billion

Total 16 billion

Percentage attributable to country T = $(6.5/16.0) \times 100\% = 40.6\%$.

Q5 Which country had the greatest percentage increase in exports of dairy products between 2001 and 2005?

Country P Country Q Country R **Country S**

In billions of dollars, the approximate amounts for each country were:

Country	2001	2005	% increase
P	2.5	3.5	40%
Q	1.5	1.75	17%
R	2.0	2.75	38%
S	0.75	1.5	100%
T	4.5	6.5	44%

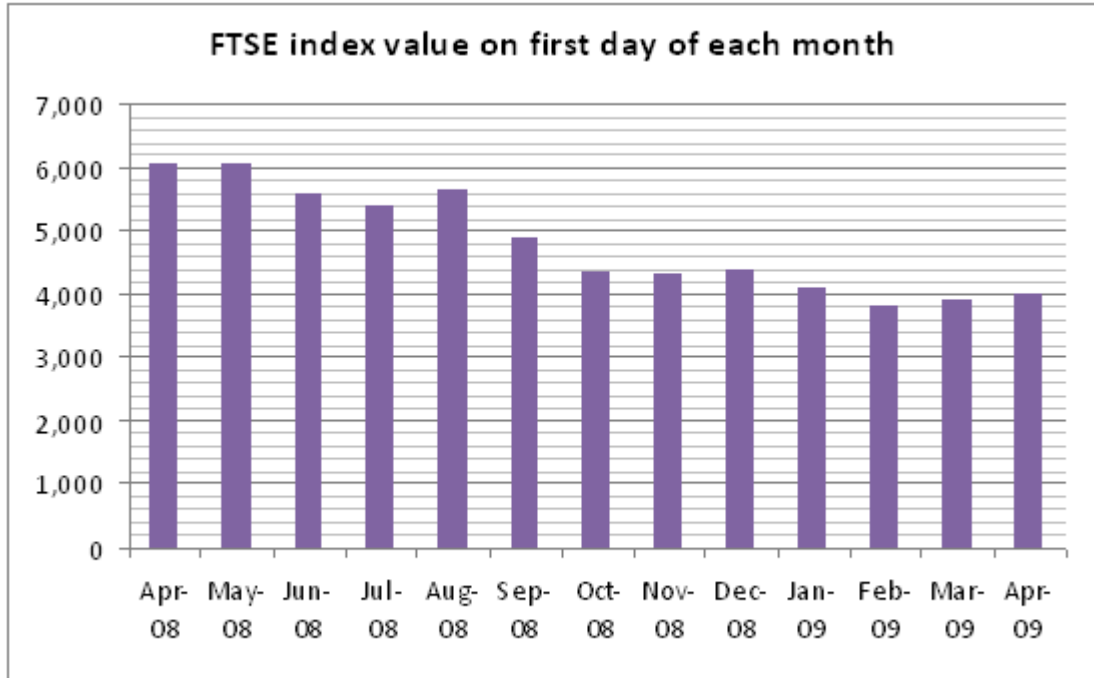
Country S had the greatest percentage increase.

Q6 Country P's exports of dairy produce were predicted to rise by 10% per year from 2005 onwards. In dollars, what was the projected figure for exports from country P in 2009?

5.5 billion **5.1 billion** 5.3 billion 5.2 billion

Country P's exports in 2005 were approximately \$3.5 billion.

The projected amount for 2009 will be $\$3.5 \times (1.1)^4$ billion = \$5.124 billion



Q7 From April 2008 to April 2009, between which two months was the sharpest drop in the value of the FTSE index?

- May 08 – June 08 **Aug 08 to Sept 08**
 Sept 08 to Oct 08 Jan 09 to Feb 09

Aug 08 to Sept 08 showed the greatest drop of approximately 700 points. This drop can be seen by just observing the graph.

Q8 To the nearest 5%, what percentage of its April 08 value was its April 09 value?

- 35% 40% **65%** 75%

Its April 08 value was approximately 6,050 and its April 09 value approximately 4,000. So $4000 / 6050 = 65\%$ to the nearest 5%.

Q9 If the value of the index were to climb by 2.5% per month over the 12 month period April 2009 to April 2010, its value would be restored most closely to that of which month shown in the graph?

- Apr 08 **July 08** Aug 08 Oct 08

Its value in April 2009 was approximately 4,000. If its value increased by 2.5% per month, its value after 12 months would be $4,000 \times (1.025)^{12} = 5,379.6$. This is closest to the value of July 2008.

Year	Murders	Burglaries	Robberies and muggings
2005	5	320	61
2006	4	381	72
2007	7	405	69

Table 1: Number of Murders, Burglaries and Robberies and muggings committed in one city

Crime	Average cost
Murders	£1.1 million
Burglaries	£4,700
Robberies and muggings	£2,300

Table 2: Total average cost of investigating and solving each crime.

Q10 By what percent did the number of burglaries increase between 2005 and 2007?

26.6% 21.0% 13.1% 6.3%

*The number of burglaries increased by $(405 - 320) = 85$
 \therefore Percentage increase = $(85/320) \times 100\% = 26.6\%$*

Q11 Based on these average costs, what was the total amount spent in investigating and solving these crimes in this city in 2005?

GBP 7,144,300 GBP 6,356,300 GBP 7,431,000 GBP 7,169,600

In 2005:

Cost of solving Murders = $5 \times \text{£}1.1 \text{ million} = \text{£}5,500,000$

Cost of solving Burglaries = $320 \times \text{£}4,700 = \text{£}1,504,000$

Cost of solving Robberies and muggings = $61 \times \text{£}2,300 = \text{£}140,300$

\therefore Total cost = $\text{£}5,500,000 + \text{£}1,504,000 + \text{£}140,300 = \text{£}7,144,300$

Q12 Based on the average costs, in 2006 what percentage of the total budget was spent on investigating and solving Robberies and muggings?

28.2%

26%

3.8%

2.6%

In 2006

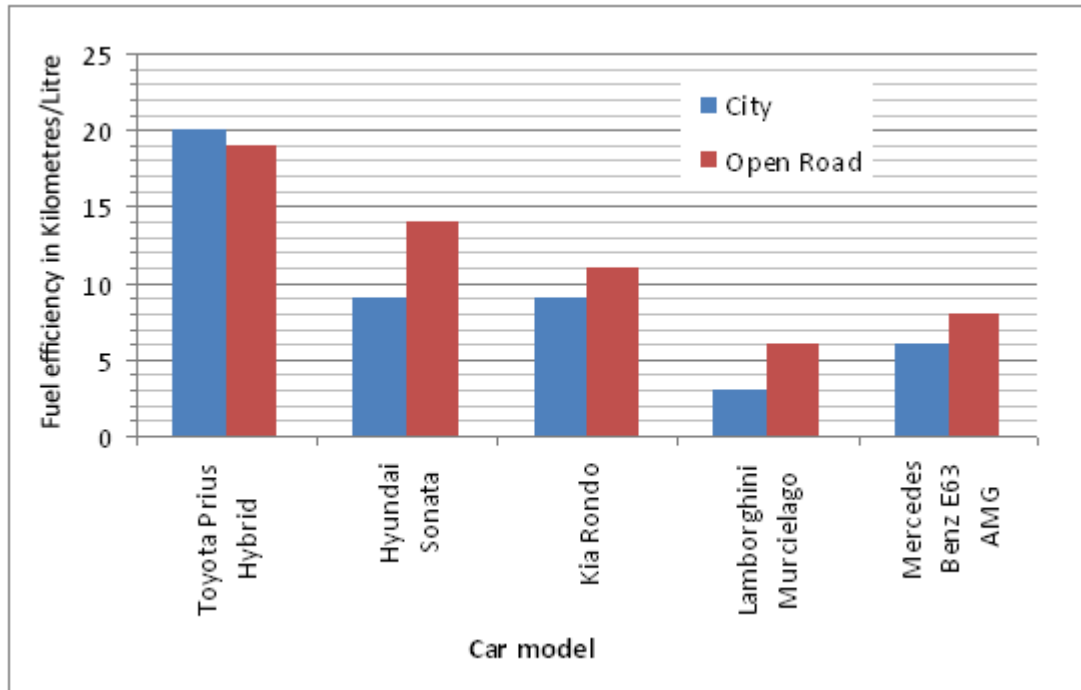
Cost of solving Murders = $4 \times \text{£}1.1 \text{ million} = \text{£}4,400,000$

Cost of solving Burglaries = $381 \times \text{£}4,700 = \text{£}1,790,700$

Cost of solving Robberies and muggings = $72 \times \text{£}2,300 = \text{£}165,600$

\therefore Total cost = $\text{£}4,400,000 + \text{£}1,790,700 + \text{£}165,600 = \text{£}6,356,300$

*\therefore Percentage spent on Robberies and muggings = $(165,600 / 6,356,300) \times 100\%$
= 2.6%*



Q13 Which car had the greatest difference in performance on the open road compared with its performance in the city?

Toyota Prius **Hyundai Sonata** Kia Rondo Lamborghini

The differences (in kilometres per litre) are:
 Toyota Prius $19 - 20 = -1$
Hyundai Sonata **$14 - 9 = 5$**
 Kia Rondo $11 - 9 = 2$
 Lamborghini Murcielago $6 - 3 = 3$
 Mercedes Benz E63 AMG $8 - 6 = 2$

The Hyundai Sonata had the greatest difference

Q14 If the Toyota Prius travelled 60 kilometres in the city, how many kilometers in the city would the Mercedes Benz travel on the same amount of petrol?

200 25.3 24 **18**

*The Prius travels 20 km per litre in the city, so would use 3 litres of petrol to travel 60km.
 The Mercedes Benz travels 6 km per litre in the city, so 3 litres would be enough to travel $3 \times 6\text{km} = 18\text{km}$*

Q15 The cost of petrol used by the Kia Rondo is 95p per litre. How much would it cost to complete a journey of 190km in a Kia Rondo if 36 kilometres of the journey is in the city?

GBP 17.10 GBP 18.05 GBP 19.50 GBP 20.05

The number of litres used in the city = $36 \div 9 = 4$

The number of litres used on the open road = $154 \div 11 = 14$

\therefore Total number of litres used = 18

\therefore Cost = $18 \times 95p = \text{£}17.10$

Q16 The cost of petrol used by the Hyundai Sonata is 95p per litre. The cost of petrol used by the Lamborghini Murcielago is 101p per litre. How much more would it cost to complete a 210 km journey on the open road in the Lamborghini than it would in the Hyundai?

GBP 42.20 GBP 24.85 GBP 24.25 **GBP 21.10**

The number of litres used by the Hyundai = $210 \div 14 = 15$

\therefore Cost in Hyundai = $15 \times 95p = \text{£}14.25$

The number of litres used by the Lamborghini = $210 \div 6 = 35$

\therefore Cost in Lamborghini = $35 \times 101p = \text{£}35.35$

\therefore Extra cost = $\text{£}35.35 - \text{£}14.25 = \text{£}21.10$

Donations made by the six largest donors of the OECD Development Assistance Committee

Country	Aid in \$US millions	Population in millions
Australia	1,556	20.3
Canada	2,597	32.3
New Zealand	184	4.1
Norway	2,042	4.6
UK	6,671	60.1
US	22,580	296.5

Q17 In millions of US\$, what was the average (mean) amount donated by the six largest donors of the OECD Development Assistance Committee?

7,126 **5,938.33** 4,271.67 2,319.50

Total amount donated = \$US 35,630 million.

∴ Average amount donated = \$US 35,630 million ÷ 6 = \$US 5,938.33 million. Don't be fooled into thinking there is more to the question than this, for example working out the average per head is not what the question asks.

Q18 Which of these six countries donated the most per capita?

United Kingdom Canada **Norway** New Zealand

The amounts given per capita by each country are found by dividing the figures from the second column of the table by the figures from the third column of the table. To the nearest whole number, these are:

Country	\$US given per capita
Australia	77
Canada	80
New Zealand	45
Norway	444
UK	111
US	76

So Norway denoted the most per capita.

Q19 The total amount donated by all member countries of the OECD Development Assistance Committee was \$US 79,191 million. If a pie chart is drawn for all countries, what would be the angle (to the nearest degree) representing the donation of the United Kingdom?

9

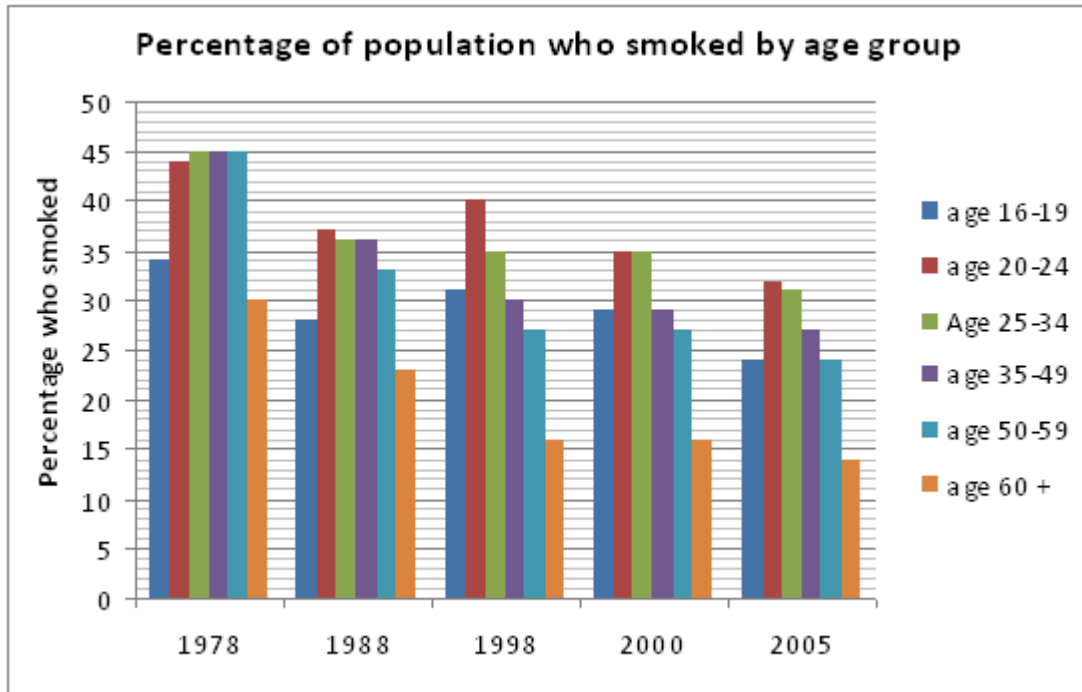
12

30

67

The United Kingdom gave \$US 6,671 million.

\therefore The angle for the UK = $(6,671/79,191) \times 360^\circ = 30.3^\circ = 30^\circ$ to the nearest degree.



Q20 For which age group has the percentage of people who smoke more than halved between 1978 and 2005?

25 - 34 35 - 49 50 - 59 **60+**

The percentage who smoked in the 60+ age group fell from 30% to 14%, a fall of 16%. 16% is more than half of 30%. The percentages for the other age ranges fell by less than half. This can be seen by inspection if time is pressing.

Q21 Which of the following age groups had the greatest percentage decline between 1998 and 2005?

20 - 24 25 - 34 35 - 49 50 - 59

The percentage declines for each of these age groups were:

16 - 19	$31\% - 24\% = 7\%$
20 - 24	$40\% - 32\% = 8\%$
25 - 34	$35\% - 31\% = 4\%$
35 - 39	$30\% - 27\% = 3\%$
50 - 59	$27\% - 24\% = 3\%$

The greatest percentage decline was in the 20 – 24 age group.

Q22 Assume that the percentages who smoked for each individual age within each age group were constant e.g. for the age group 16 – 19 in 1978, assume 34% of people of age 16 smoked, 34% of people of age 17 smoked, 34% of people of age 18 smoked and 34% of people of age 19 smoked. For those people born in 1956, what percentage on average gave up smoking between 1978 and 1998?

14% 12% 9% 8%

A person born in 1956 would have been 22 years old (in the 20 – 24 age group) in 1978 and 42 years old (in the 35 – 49 age group) in 1998.

The percentage of 22 year olds who smoked in 1978 was 44%

The percentage of 42 year olds who smoked in 1998 was 30%

∴ On average 14% gave up smoking between 1978 and 1998.

Q23 By expressing the decrease as a percentage of the 1978 figures, which of the following age groups showed the least improvement between 1978 and 1988?

16 – 19 **20 -24** 25 - 34 50 - 59

During that period the percentage decreases were:

16 - 19	$6/34 \times 100\% = 17.6\%$
20 - 24	$7/44 \times 100\% = 15.9\%$
25 - 34	$9/45 \times 100\% = 20\%$
50 - 59	$12/45 \times 100\% = 26.7\%$
60+	$7/30 \times 100\% = 23.3\%$

The least improvement is shown by the 20 – 24 age group.

Year	Output (millions of tonnes)	Manpower (thousands)	Output/Manpower
1994-1995	29	15	1.933
1995-1996	35.2	15.1	2.331
1996-1997	32.1	13.9	2.309
1997-1998	28.1	11.2	2.509
1998-1999	23.8	9.8	2.429
1999-2000	19.6	8.2	2.39
2000-2001	17.4	8.6	2.023
2001-2002	18.1	8.1	2.235
2002-2003	15.8	6.6	2.394
2003-2004	14.7	6.1	2.41
2004-2005	11.5	4.6	2.5
2005-2006	10.3	4.1	2.512
2006-2007	8.2	3.6	2.278

Q24 Which year showed an increase in production but with a lesser manpower compared with the previous year?

1997-1998 2000-2001 **2001-2002** 2005-2006

Only two years showed an increase in production – 1995-1996 and 2001-2002. Of these, only 2001 – 2002 used less manpower than the previous year.

Q25 Which year showed the greatest decrease in manpower compared with the previous year?

1996-1997 **1997-1998** 1998-1999 2002-2003

The greatest decrease was in 1997-1998 with a decrease of 2.7 thousand compared with 1996-1997.

Q26 Which year showed the greatest production per man?

1997-1998 2000-2001 2004-2005 **2005-2006**

To find the output per thousand men, divide column 2 by column 3:

Year	Output (millions of tonnes)	Manpower (thousands)	Output/Manpower
1994-1995	29.0	15.0	1.933
1995-1996	35.2	15.1	2.331
1996-1997	32.1	13.9	2.309
1997-1998	28.1	11.2	2.509
1998-1999	23.8	9.8	2.429
1999-2000	19.6	8.2	2.390
2000-2001	17.4	8.6	2.023
2001-2002	18.1	8.1	2.235
2002-2003	15.8	6.6	2.394
2003-2004	14.7	6.1	2.410
2004-2005	11.5	4.6	2.500
2005-2006	10.3	4.1	2.512
2006-2007	8.2	3.6	2.278

2005-2006 shows the greatest output per thousand men and hence the greatest output per man.

Q27 What was the output in 2006-2007 as a percentage of the output in 1996-1997?

25.5% 25.9% 28.3% 32.1%

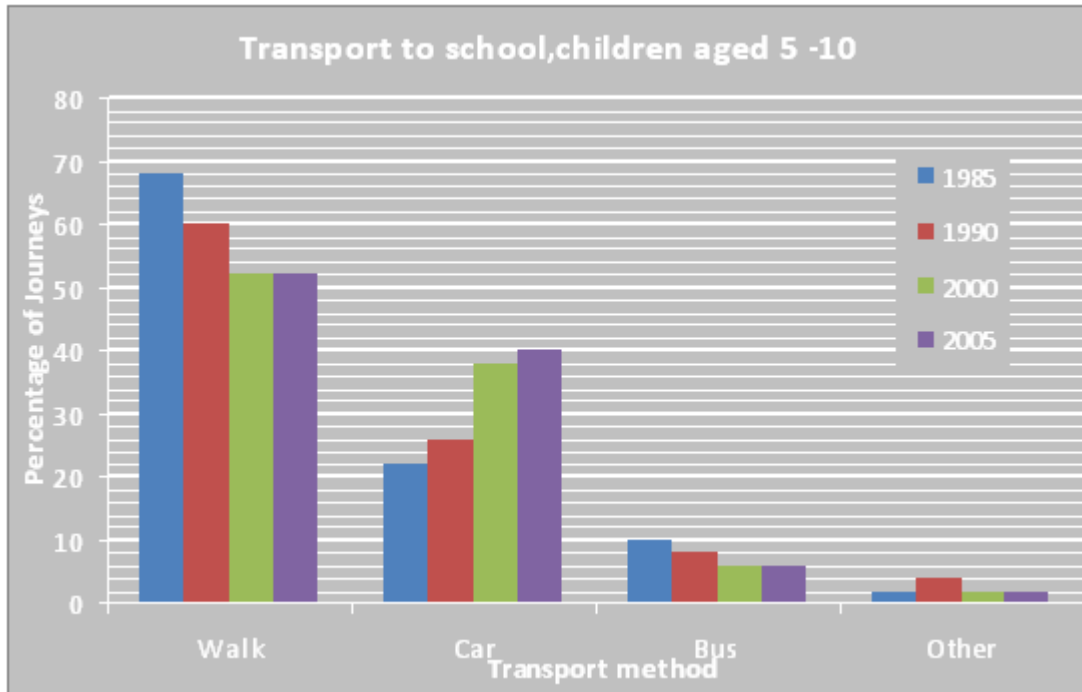
Output in 1996-1997 = 32.1 million tones.

Output in 2006-2007 = 8.2 million tones.

\therefore Output in 2006-2007 as a percentage of the output in 1996-1997

$= 8.2/32.1 \times 100\%$

$= 25.5\%$



Q28 What was the difference between share of car journeys in 1985 and share of car journeys in 2005?

82% 41% 21% **18%**

The trick here is to realize that 'share' means percentage. So in 1985 the share of journeys made by car was 22%. In 2005 the share of journeys made by car was 40%. So the difference in the share was simply (40%-22% =) 18%.

This calculation would be different if the question had asked "what was the percentage increase in number of journeys made by car between 1985 and 2005". This would be asking the percentage change and since we do not know the total journeys made for these years we would be unable to say.

Q29 If the percentage of children aged 5 – 10 walking to school over the 20 year period 2005 to 2025 drops by the same amount as it did between 1985 and 2005, what percentage of children will walk to school in 2025?

36% 41% 50% 51%

The percentage who walked to school in 2005 was 52% compared with 68% in 1985 – a decrease of 16%. If this trend continues then (52 – 16) % = 36% will walk to school in 2025.

Q30 The number of primary school journeys made in 2005 was 4.5 million. Approximately how many of these journeys were made by bus?

450,000

405,000

315,000

270,000

The percentage that were by bus in 2005 was 6% (from the graph).

Now 6% of 4.5 million = $0.06 \times 4,500,000 = 270,000$.