

# Numerical Test 1

## Solutions Booklet

### Instructions

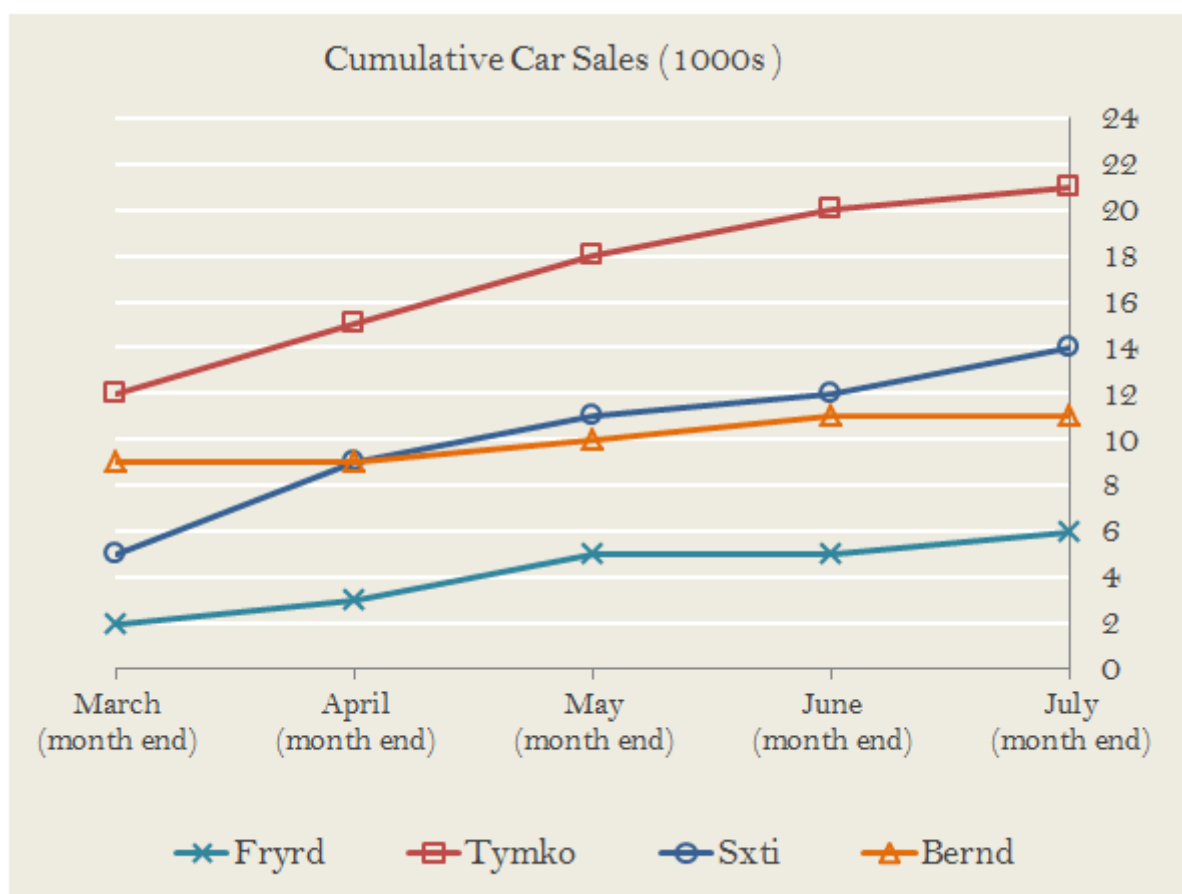
This is a warm-up test comprising just **12 questions**. You will have **15 minutes** to answer them.

Calculators are permitted for this test, and it is recommended you have some rough paper to work on.

You will have to work quickly and accurately to perform well in this test. If you don't know the answer to a question, leave it and come back to it if you have time.

Each question will have four possible answers, one of which is correct. You may click Back and Next during the test to review or skip questions.

Try to find a time and place where you will not be interrupted during the test. When you are ready, turn to the next page and begin.



**Q1** How many Bernd cars were sold in May?

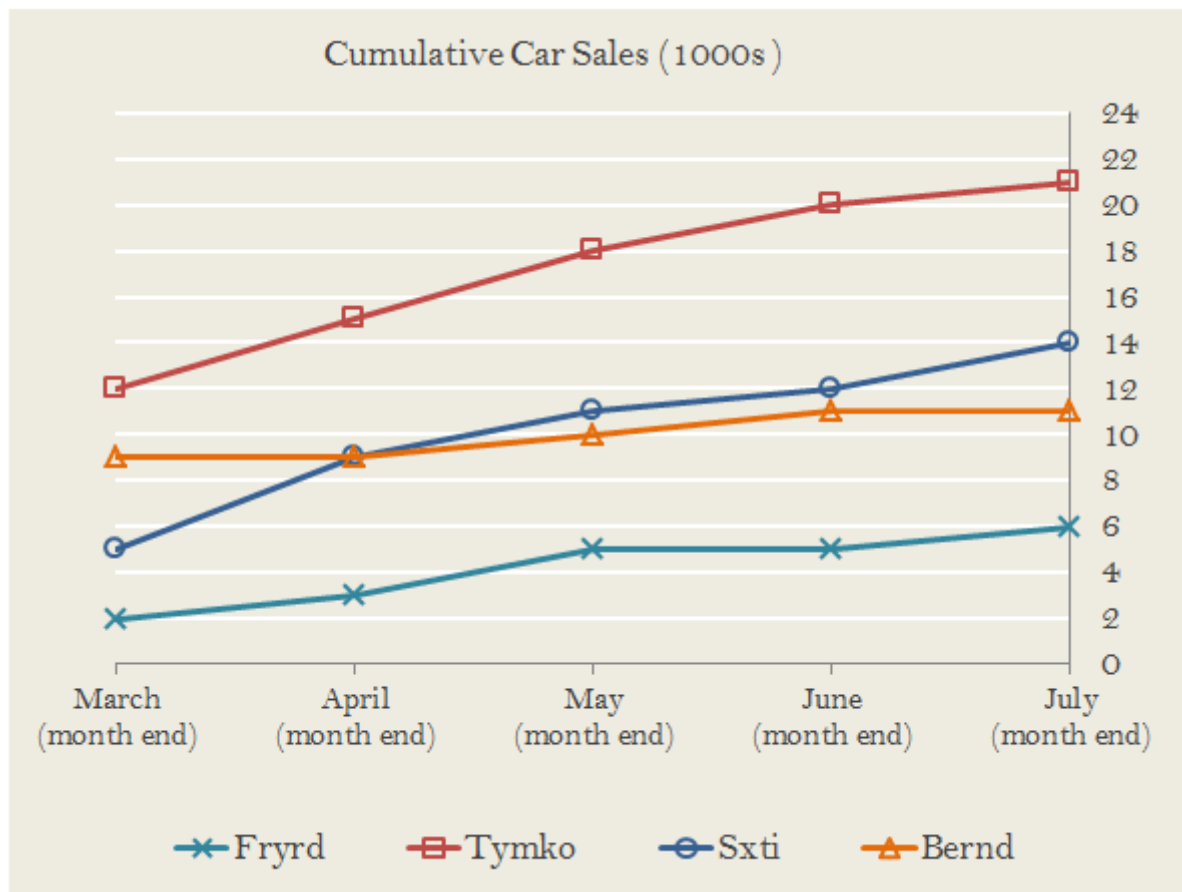
- (A) 10
- (B) 1,000
- (C) 5,000
- (D) 10,000

*The trick to this question is to recognise that the graph gives sales figures cumulatively.*

**Step 1** - We see from the graph that the cumulative Bernd sales at the end of April are 9,000. We see that the cumulative Bernd sales at the end of May are 10,000.

**Step 2** - Therefore during May ( $10,000 - 9,000 =$ ) 1,000 Bernd cars must have been sold.

*Thus the correct answer is (B) 1,000*



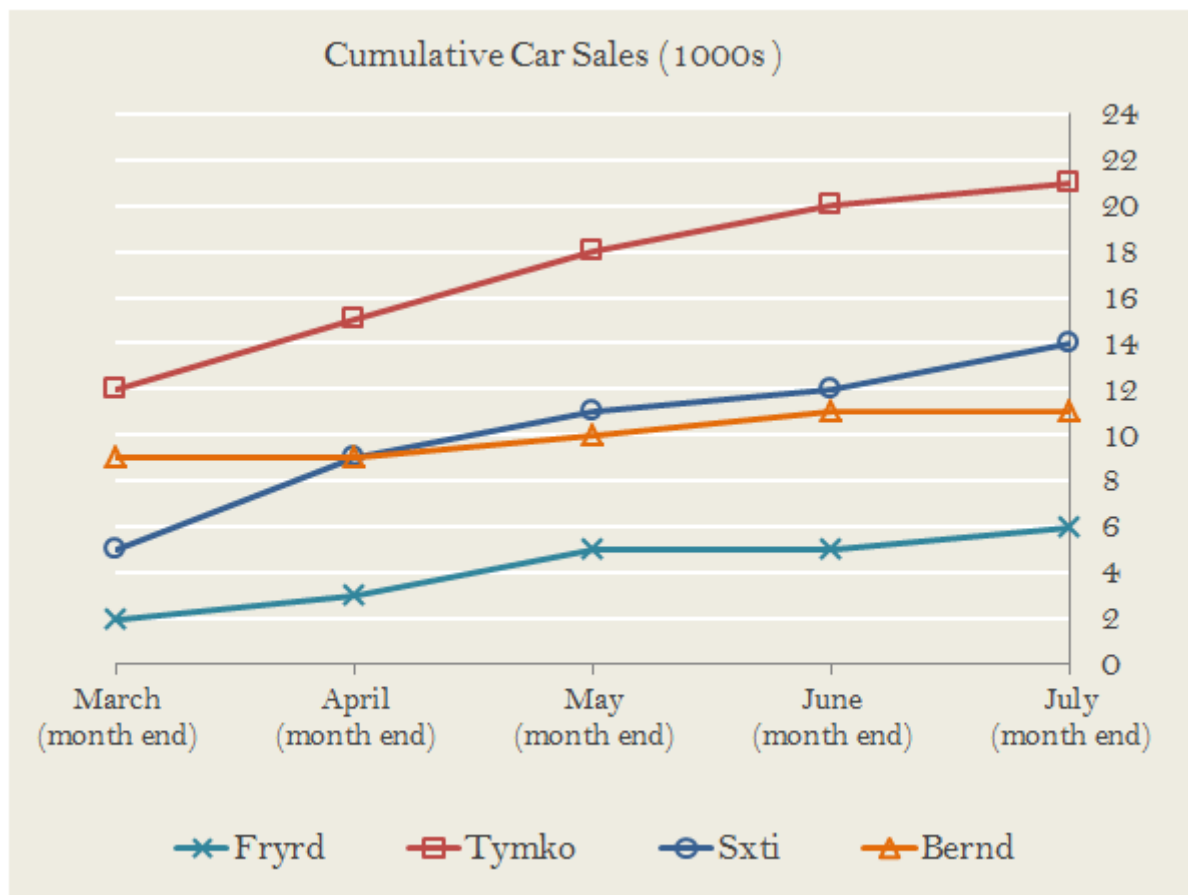
**Q2** What were the total sales of Tymko cars for May, June and July combined?

- (A) 21,000
- (B) 16,000
- (C) 22,000
- (D) 6,000

*Don't waste time working out the sales for each month. Since the data is cumulative, we can say combined sales for May, June and July = (cumulative sales for end of July) – (cumulative sales end of April).*

**Step 1** - (Cumulative sales July) – (Cumulative sales April) = (21,000) – (15,000) = 6,000

*Thus the correct answer is (D) 6,000*



**Q3** If the number of Bernd cars sold in July had been equal to the number of Bernd cars sold in June, how many more Bernd cars would have been sold during July?

- (A) 1,000
- (B) 1
- (C) 12,000
- (D) 2,000

**Step 1** - First, find out the number of Bernd cars sold in June. From the cumulative graph we see this is 1,000.

**Step 2** - Now, compare this with how many Bernd cars were actually sold in July. We see from the graph there were no sales  $1,000 - 0 = 1,000$

Thus the correct answer is (A) 1,000

## City Population Composition (Year 2000)

	Population at start of year (thousands)	Live births per 1000 population (Jan-Dec)	Deaths per 1000 population (Jan-Dec)	% Population under 15 at start of year	% Population aged 60 or over at start of year
London	7,500	11.2	9.7	16	18
Birmingham	995	13.6	12.7	18	22
Glasgow	600	13.8	13.2	21	21
Liverpool	500	13.4	12.4	22	22
Leeds	450	14.1	13.0	23	23

**Q4** In Liverpool what was the net effect of live birth and death rates on the population during 2000?

- (A) 200 decrease
- (B) 600 increase
- (C) 500 increase
- (D) 300 increase

**Step 1** - In Liverpool the population was 500,000 at the start of the year. We are told there were 13.4 births per thousand of the population. So this means there were  $(500 \times 13.4 =)$  6,700.

**Step 2** - We are told there were 12.4 deaths per thousand of the population, i.e.  $500 \times 12.4 =$  6,200.

**Step 3** - The net effect on population is  $6,700 - 6,200 = 500$ .

Thus the correct answer is (C) 500 increase.

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**Q5** How many live births occurred in 2000 in Birmingham and Glasgow combined?

- (A) 21,812
- (B) 18,210
- (C) 16,700
- (D) 32,100

*Step 1 - In Birmingham there were  $995 \times 13.6 = 13,532$  births. In Glasgow there were  $600 \times 13.8 = 8,280$  live births. In total that is  $13,532 + 8,280 = 21,812$*

*Thus the correct answer is (A) 21,812*

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**Q6** Of the cities shown, which had the lowest number of people under the age of 15 at the start of the year 2000?

- (A) Birmingham
- (B) Glasgow
- (C) Liverpool
- (D) Leeds

**Tip** - The question says "of the cities shown". Without this technically we would have to respond "cannot say" because we are not told any information about any other cities and therefore we would not be able to say with any certainty which had the lowest number. As it happens in this question "cannot say" is not an option so we would have been OK, but it's a catch worth looking out for.

**Step 1** - Work through each city shown calculating the number of under 15 year olds. Don't worry about entering the thousands in your calculator – this just wastes time.

London: don't bother calculating as it is not a possible answer.

Birmingham:  $995 \times 0.18 = 179.1$

Glasgow:  $600 \times 0.21 = 126$

Liverpool:  $500 \times 0.22 = 110$

Leeds:  $450 \times 0.23 = 103.5$

Thus the correct answer is (D) Leeds

### Money spent on public transport (£billion)

	2006	2007	2008	2008 population
UK	32	35	38	60,100,000
US	121	128	136	302,500,000
Germany	39	44	46	84,300,000
Italy	25	26	28	58,700,000

**Q7** Which of the countries shown experienced the largest percentage increase in public transport spending from 2007 to 2008?

- (A) UK
- (B) US
- (C) Germany
- (D) Cannot tell

**Step 1** - Calculate the percentage increase from 2007 to 2008 for each country. Don't bother with the billions, the percentage calculation won't be affected.

UK:  $38 \div 35 = 8.57\%$  increase

US:  $136 \div 128 = 6.25\%$  increase

Germany:  $46 \div 44 = 4.55\%$  increase

Italy:  $28 \div 26 = 7.69\%$  increase

Thus the correct answer is (A) UK

**Tip:** we will be using this short-hand method of calculating percentages as it saves time. If you prefer you can do it the long way. So for example the UK percentage would be as follows.

Step 1:  $(38-35) \div 35 = 0.085714$

Step 2:  $0.085714 \times 100 = 8.5714$

Step 3: 8.57% increase



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**Q8** Which of the countries shown had the highest public transport spend per capita in 2008?

- (A) UK
- (B) US
- (C) Germany
- (D) Cannot say

*Step 1 - Simply divide the public transport spend by the population for each country. Again, use units which simplify the calculation because we are only interested in the relative order of magnitude.*

*UK:  $38 \div 60.1 = 0.632$*

*US:  $136 \div 302.5 = 0.450$*

*Germany:  $46 \div 84.3 = 0.546$*

*Italy: don't bother as this is not an option.*

*Thus the correct answer is (A) UK*

**Q9** In 2007 Italy had a target to spend 8% more on public transport than they did in 2006. By how much were they short of this target?

- (A) £1 million
- (B) £1 billion
- (C) £0.1 billion
- (D) Cannot tell

**Step 1** - In 2006 Italy spent £25 billion An increase of 8% is:  $£25 \text{ billion} \times 1.08 = £27 \text{ billion}$ .

**Step 2** - We see from the table that Italy actually spent £26 billion. That's £1 billion short of the target.

*Thus the correct answer is (B) £1 billion*

## Internet sales data for Newbags.com

Visitors from	Number of visitors	Number of visitors who made a purchase
Website W	315,380	2,876
Website X	26,850	284
Website Y	82,520	183
Website Z	12,630	204

**Q10** Visitors arriving from which website were most likely to make a purchase at newbags.com?

- (A) Website W
- (B) Website X
- (C) Website Y
- (D) Website Z

*Step 1 - For each arrival website, calculate the percentage of visitors who made a purchase out of the number of visitors.*

$$W: 2,876 \div 315,380 = 0.912\%$$

$$X: 284 \div 26,850 = 1.06\%$$

$$Y: 183 \div 82,520 = 0.222\%$$

$$Z: 204 \div 12,630 = 1.62\%$$

*Thus the correct answer is (D) Website Z*

**Q11** If the average profit made per sale at newbags.com was £12, approximately how much more profit was made from visitors from Website X than visitors from Website Y?

- (A) £1,212
- (B) £1,852
- (C) £867
- (D) £891

*Step 1 - Calculate how many more sales came from Website X than from Website Y.*  
 $284 - 183 = 101$ .

*Step 2 - Calculate the profit difference.*  $101 \times £12 = £1,212$

*Thus the correct answer is (A) £1,212*

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**Q12** Assuming all visitors arrived via either website W, X, Y or Z, approximately what percentage of visitors arrived at newbags.com from Website Y?

- (A) 15.7%
- (B) 18.9%
- (C) 25.0%
- (D) 30.3%

**Step 1** - Add up the total number of visitors.  $315,380 + 26,850 + 82,520 + 12,630 = 437,380$ .

**Step 2** - Calculate the percentage of them who came from Website Y.  $82,520 \div 437,380 = 18.87\%$

Thus the correct answer is (B) 18.9%

**-- End of Test --**