

The screenshot shows a digital test interface. On the left, there is a bar chart titled 'Company Inflation Indices for 2008 (Relative to 100 at 1st Quarter)'. The chart has four bars representing different companies: 'Company A' (red), 'Company B' (green), 'Company C' (blue), and 'Company D' (orange). The y-axis is labeled 'Index' and ranges from 0 to 100. The x-axis is labeled 'Quarter' and has four categories: 'Q1', 'Q2', 'Q3', and 'Q4'. The bars show varying trends: Company A starts at 100 and rises to approximately 115; Company B starts at 100 and rises to approximately 125; Company C starts at 100 and rises to approximately 110; Company D starts at 100 and rises to approximately 105. On the right, there is a question box with the text: 'Question 2: The average bank loan interest rates 100 Quarters of quarterly change from month with lowest rate (quarter prior)?'. Below the question are four radio button options: 'A) 100%', 'B) 105%', 'C) 110%', and 'D) 115%'. The interface includes navigation buttons like 'Previous' and 'Next'.

Numerical Reasoning Practice Test 4

Solution Booklet

Tze Motor Cars - Accounts (2006-2010)

	2010	2009	2008	2007	2006
Sales	£1,047.9 m	£761.9 m	£1,005.0 m	£627.7 m	£637.8 m
Car units sold	16,710	12,636	15,905	12,163	12,360
Average sales price (per car)	£62,709	£60,296	£63,188	£51,607	£51,602
Average production cost (per car)	£14,500	£15,800	£13,600	£11,400	£13,750
Annual service charge	£250	£300	£350	£275	£400

- Q1** In which year was there the highest ratio of average sales price: average production cost?
- (A) 2006
 - (B) 2007
 - (C) 2008
 - (D) 2009
 - (E) 2010

Calculate the ratio for each of the 5 years shown;

	2010	2009	2008	2007	2006
<i>Average sales price</i>	£62,709	£60,296	£63,188	£51,607	£51,602
<i>Production cost</i>	£14,500	£15,800	£13,600	£11,400	£13,750
<i>Ratio</i>	4.3:1	3.8:1	4.6:1	4.5:1	3.8:1

Thus the correct answer is (C), 2008

Q2 What were the total production costs for 2009 (to the nearest £100,000)?

- (A) £199.6 million
- (B) £199.7 million
- (C) £216.2 million
- (D) £216.3 million
- (E) £242.2 million

Production costs = production cost per car x number of cars
= £15,800 x 12,636 = £199.648 million
= £199.6 million (to the nearest £100,000)

Thus the correct answer is (A), £199.6 million

Q3 If each car produced was offered with a free first year's service, in which year would this have cost the car manufacturer the least amount?

- (A) 2006
- (B) 2007
- (C) 2008
- (D) 2009
- (E) 2010

Calculate the cost to the car manufacturer for each of the 5 years as shown below:

	2010	2009	2008	2007	2006
<i>Car units sold</i>	<i>16,710</i>	<i>12,636</i>	<i>15,905</i>	<i>12,163</i>	<i>12,360</i>
<i>Service charge</i>	<i>£250</i>	<i>£300</i>	<i>£350</i>	<i>£275</i>	<i>£400</i>
<i>Cost to car manufacturer</i>	<i>£4.18 million</i>	<i>£3.79 million</i>	<i>£5.57 million</i>	<i>£3.34 million</i>	<i>£4.94 million</i>

Thus the correct answer is (B), 2007

Q4 If the average sales price for 2010 was 5% higher, but the number of cars sold that year was 9% lower, by what percent would the sales revenue have decreased for 2010?

- (A) No change
- (B) 3.50%
- (C) 3.55%
- (D) 4.45%
- (E) 4.60%

Step 1 – calculate the new average sales price
 $£62,709 \times 105\% = £65,844.45$

Step 2 – calculate the new number of cars sold
 $16,710 \times 91\% = 15,206.1$

Note: they can't sell .1 of a car so will use 15,206.0. In this question it doesn't actually make a difference to the final answer but it's worth remembering things like this for other questions.

Step 3 – calculate the total sales increase
 $£65,844.45 \times 15,206 = £1,001.230707$ million

Step 4 – calculate the total sales decrease as a %
 $1,001.230707 \div 1,047.9 = 0.95546$, which is a 4.45% decrease.

Thus the correct answer is (D), 4.45%

Q5 In 2008, sales were split across 3 car models in the ratio of 7:8:6 for models A, B and C respectively. What was the sales revenue for model A?

- (A) £287 million
- (B) £335 million
- (C) £382 million
- (D) £383 million
- (E) Can't tell from data

Apply the ratio to the total sales for 2008
 $7 \times £1,005.0 \text{ m} / 21 = £335$ million

Thus the correct answer is (B), £335 million

YLF plc – Total costs by year (£000s)

	2006	2007	2008	2009	2010
Staff costs	226	234	248	230	215
Property depreciation	120	117	112	115	132
Inventories	11,410	12,505	11,842	15,322	16,420
Loan impairment	13	12	9	17	22
Other expenses	336	459	357	413	502

Q6 For how many years has the combined cost of Property depreciation and Staff costs exceeded that of Other expenses?

- (A) 1 year
- (B) 2 years
- (C) 3 years
- (D) 4 years
- (E) 5 years

Step 1 – calculate each year's combined cost of Property depreciation and Staff costs

	2006	2007	2008	2009	2010
<i>Staff costs + Property depreciation</i>	226 + 120 = 346	234 + 117 = 351	248 + 112 = 360	230 + 115 = 345	215 + 132 = 347
<i>Step 2 > or < Other expenses?</i>					
	> 336	< 459	> 357	< 413	< 502

Thus the correct answer is (B), 2 years

Q7 In which year, or years, was there a 2:1 Staff costs: Property depreciation ratio?

- (A) 2010
- (B) 2007 and 2008
- (C) 2008 and 2009
- (D) 2007 and 2009
- (E) 2006, 2007 and 2009

This can probably be done in your head: go along the columns and double the Property depreciation to see if it equals the Staff costs. You will see this is true for years 2007 and 2009.

In long-hand tabular form we have for each year:

	2006	2007	2008	2009	2010
Staff costs/ Property depreciation	226/120	234/117	248/112	230/115	215/132
Ratio	>2	2	>2	2	<2

Thus the correct answer is (D), 2007 and 2009

Q8 What percent of total costs did Property depreciation represent in 2007?

- (A) 4.7%
- (B) 3.7%
- (C) 2.7%
- (D) 1.9%
- (E) 0.9%

Tip: Notice the top of the table tells us we are looking at "Total costs by year". This enables us to answer the question. If we were not told the costs given are the whole picture (i.e. Total costs) we would be right to say "cannot say" since we would not know if there are other costs we don't know about. Watch out for this in other questions.

Step 1 – calculate total costs

$$234 + 117 + 12,505 + 12 + 459 = 13,327$$

Step 2 - calculate Property depreciation as a % of total costs

$$117 / 13,327 = 0.878\%$$

Thus the correct answer is (E) 0.9%

Q9 Which cost changed by the second largest percent from 2008 to 2010?

- (A) Other expenses
- (B) Staff costs
- (C) Loan impairment
- (D) Inventories
- (E) Property depreciation

Step 1 – calculate the % change for each of the 6 costs between the years 2008 to 2010.

Staff costs	$215 / 248 = 0.867$; 13.3% decrease
Property depreciation	$132 / 112 = 1.179$; 17.9% increase
Inventories	$16,420 / 11,842 = 1.387$; 38.7% increase
Loan impairment	$22 / 9 = 2.44$; 144.4% increase
Other expenses	$502 / 357 = 1.406$; 40.6% increase

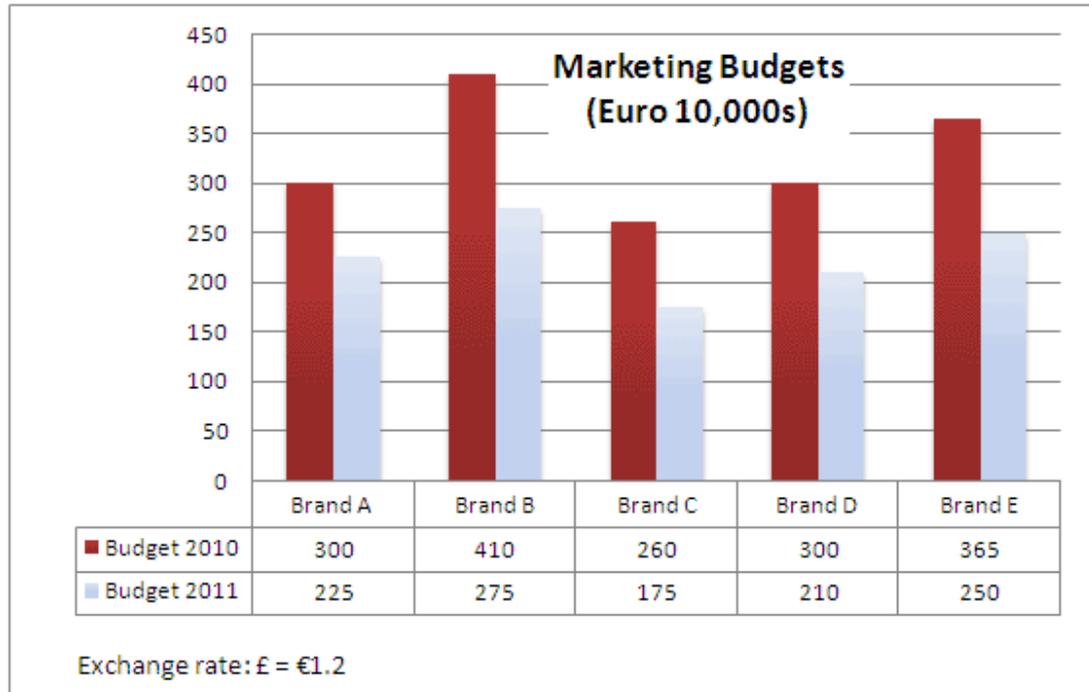
Thus the correct answer is (A), Other expenses

Q10 If the 2006 Inventories cost had increased by an eighth compared to the previous year, what was the previous year's Inventories cost (to the nearest £10,000)?

- (A) £10.41 million
- (B) £10.14 million
- (C) £1.04 million
- (D) £1.01 million
- (E) Can't tell from data

To increase by an eighth (12.5%) we simply multiply by 1.125. So we can say (previous year's Inventory costs) $\times 1.125 = £11,410$. Rearranging we have previous year's inventory costs = $(£11,410 \div 1.125) = £10,142,222$

Thus the correct answer is (B), £10.14 million



Q11 Between 2010 and 2011 what is the total cut in the marketing budget across the 5 Brands (in €10,000s)?

- (A) 135
- (B) 400
- (C) 500
- (D) 1,135
- (E) 1,535

Step 1 – calculate the 2010 total marketing budget for each Brand
 $300 + 410 + 260 + 300 + 365 = 1635$

Step 2 – calculate the 2011 total marketing budget for each Brand
 $225 + 275 + 175 + 210 + 250 = 1135$

Step 3 – calculate cut
 $2010 \text{ marketing budget} - 2011 \text{ marketing budget} = 1635 - 1135 = 500 \text{ (in €10,000s)}$

So the correct answer is (C), 500

Q12 Which Brand has suffered the largest percentage cut in its Marketing Budget?

- (A) Brand A
- (B) Brand B
- (C) Brand C
- (D) Brand D
- (E) Brand E

Step 1 - Calculate the % cut for each branch from 2010 to 2011:

Brand A = $75/300 \times 100\% = 25\%$

Brand B = $135/410 \times 100\% = 32.9\%$

Brand C = $85/260 \times 100\% = 32.7\%$

Brand D = $90/300 \times 100\% = 30\%$

Brand E = $115/365 \times 100\% = 31.5\%$

So the correct answer is (B), Brand B

Q13 Between 2010 and 2011 what has been the mean percentage Budget reduction for each of the 5 Brands (to 1 decimal place)?

- (A) 30.4%
- (B) 30.5%
- (C) 31.4%
- (D) 31.5%
- (E) 32.4%

Step 1 - Calculate the % cut for each Brand. If you still have your notes from the previous question you can re-use those to save time:

Brand A = $75/300 \times 100\% = 25\%$

Brand B = $135/410 \times 100\% = 32.9\%$

Brand C = $85/260 \times 100\% = 32.7\%$

Brand D = $90/300 \times 100\% = 30\%$

Brand E = $115/365 \times 100\% = 31.5\%$

Step 2 – calculate mean reduction.

$(25 + 32.9 + 32.7 + 30 + 31.5)/5 = 30.42\%$

Step 3 – calculate answer to 1 decimal place

30.4%

So the correct answer is (A), 30.4%

Q14 Brand A and Brand D are to have their number of staff reduced by the same percentage reduction seen by their Marketing Budgets between 2010 and 2011. If the number of staff at Brand A was originally 120 and the number of staff at Brand D triple this, what are the new reduced staff numbers for each Brand?

- (A) Can't tell from the data
- (B) 35 (Brand A); 142 (Brand D)
- (C) 90 (Brand A); 252 (Brand D)
- (D) 60 (Brand A); 240 (Brand D)
- (E) 50 (Brand A); 360 (Brand D)

Step 1 – calculate the percentage reduction in Marketing Budget for each Brand.

Brand A: $225 / 300 = 25\%$ reduction

Brand D: $210 / 300 = 30\%$ reduction

Step 2 – calculate the new number of staff for Brand A

$120 \times 0.75 = 90$

Step 3 – calculate the new number of staff for Brand D

$(120 \times 3) \times 0.7 = 252$

So the correct answer is (C), 90 (Brand A); 252 (Brand D)

Q15 The total 2011 Marketing Budget for all five Brands is to be cut by a quarter in 2012. In £, what is the 2012 Marketing Budget? (to the nearest £100,000)?

- (A) £3 million
- (B) £3.1 million
- (C) £5.2 million
- (D) £6.2 million
- (E) £7.1 million

Step 1 – calculate the 2012 marketing budget

2011 marketing budget (from previous question) = 1135 (€10,000s)

2012 marketing budget = €11.35 million \times 75% = €8.5125 million

Step 2 – convert into £

$8,512,500 / 1.2 = £7.094$ million

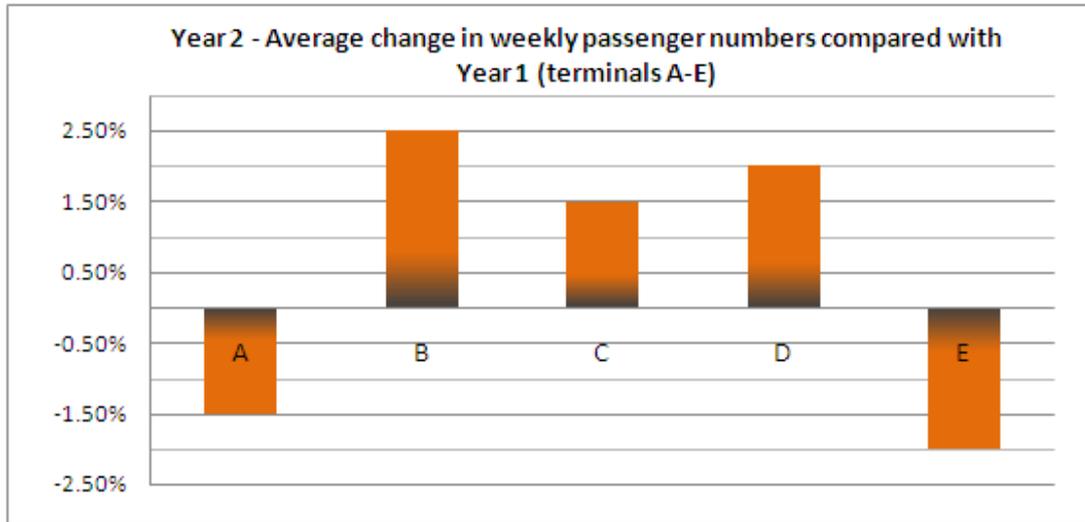
Step 3 – put answer into the nearest £100,000

£7.1 million

So the correct answer is (E), £7.1 million

Year 1 - Average number of passengers per week (1,000s)

All Terminals	A	B	C	D	E
Male passengers	52.9	66.6	62.9	77.1	78.8
Female passengers	52.7	66.5	63.1	76.9	78.5



Q16 Which terminal had the highest number of passengers per week in Year 2?

- (A) Terminal A
- (B) Terminal B
- (C) Terminal C
- (D) Terminal D
- (E) Terminal E

The information that you need is shown in both the table and the graph.

Step 1

Given Year 2's 1.5-2.5% increases in passenger numbers, save time by considering only which terminals have the highest number of passengers per week in Year 1. This is Terminal D and E.

Calculate Year 1's total passengers for Terminals D and E (by adding male and female passenger numbers):

$$\text{Terminal D} = 77.1 + 76.9 = 154$$

$$\text{Terminal E} = 78.8 + 78.5 = 157.3$$

Step 3 - calculate Year 2's totals for these Terminals:

$$\text{Terminal D} = 154 \times 102\% = 157.08$$

$$\text{Terminal E} = 157.3 \times 98\% = 154.15$$

So the correct answer is (D), Terminal D

Q17 For Year 1 what was the average weekly difference between male and female passengers per terminal?

- (A) 2,200 more males
- (B) 1,200 more males
- (C) 220 more females
- (D) 140 more females
- (E) 120 more males

The information that you need is shown in the table.

Step 1 – calculate the total difference between the weekly numbers of male and female passengers

$$(52.9 - 52.7) + (66.6 - 66.5) + (62.9 - 63.1) + (77.1 - 76.9) + (78.8 - 78.5) = 0.6$$

Step 2 – calculate the average difference

$$= 0.6 / 5 \text{ (1,000s)}$$

$$= 0.12 \text{ (1,000s)}$$

$$= 120 \text{ more male passengers}$$

So the correct answer is (E) 120 more males

Q18 Terminals A and D serve domestic flights, whilst Terminals B, C and E serve international flights. Each week on average how many more passengers in Year 1 took international flights compared to domestic flights (to the nearest 10,000)?

- (A) 14,000
- (B) 15,000
- (C) 140,000
- (D) 150,000
- (E) 160,000

The information that you need is shown in the table.

Step 1 – calculate the total numbers of domestic flights and international flights

$$\text{Domestic flight total} = 52.9 + 52.7 + 77.1 + 76.9 = 259.6$$

$$\text{International flight total} = 66.6 + 66.5 + 62.9 + 63.1 + 78.8 + 78.5 = 416.4$$

Step 2 – calculate the difference

$$416.4 - 259.6 = 156.8 \text{ (1,000's)}$$

$$= 156,800$$

Step 3 - to the nearest 10,000

$$160,000$$

So the correct answer is (E), 160,000

Q19 In Year 2 each passenger spends on average £4.25 in Terminal C's shops. How much is the average weekly revenue for Terminal C's shops in Year 2 (to the nearest £10,000)?

- (A) £4,400,000
- (B) £540,000
- (C) £54,000
- (D) £46,000
- (E) £44,000

Step 1 – calculate Year 2 passenger total for Terminal C

$$(62.9 + 63.1) \times 101.5\% = 127.89$$

$$\text{In 1,000's} = 127,890$$

Step 2 – calculate the average weekly revenue generated

$$127,890 \times £4.25 = £543,532.5 \text{ (£540,000 to the nearest £10,000)}$$

So the correct answer is (B), £540,000

Q20 A competitor airport operator called Vefy Flights operates a different airport with half the average Year 1 weekly number of passengers operating from 3 terminals. What is Vefy Flights's average weekly number of passengers per terminal (to the nearest 1,000)?

- (A) 110,000
- (B) 113,000
- (C) 133,000
- (D) 142,000
- (E) 150,000

Step 1 – calculate the total number of Terminal A-E passengers.

$$\text{Total number of Terminal A-E passengers} = 676.$$

Step 2 - calculate Vefy Flights's average weekly number of passengers

$$676 \times 0.5 = 338$$

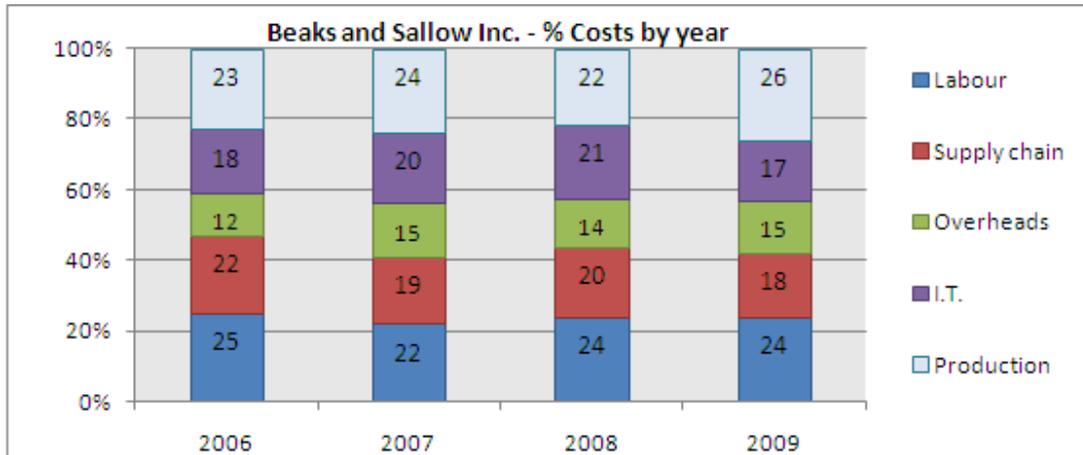
Step 3 – calculate Vefy Flights's average weekly number of passengers per terminal

$$338 / 3 = 112.667 \text{ (1,000's)}$$

$$= 112,667$$

$$= 113,000 \text{ (to the nearest 1,000)}$$

So the correct answer is (B), 113,000



2010 Total Costs (£10,000s)	Quarter 1	Quarter 2	Quarter 3	Quarter 4
Overheads	104	105	102	101
Supply chain	186	174	162	166
Labour	248	245	319	265
I.T.	149	138	140	191
Production	227	253	291	287

Q21 If the total 2010 costs represent a 5% increase on the total 2009 costs, what were the total 2009 costs (to the nearest £million)?

- (A) £3 million
- (B) £4 million
- (C) £36 million
- (D) £37 million
- (E) £38 million

The information for 2010 that you need is shown in the table.

Step 1 – calculate the total costs for 2010

Q1 total = 914

Q2 total = 915

Q3 total = 1,014

Q4 total = 1,010

Total = 3,853

Step 2 – calculate the total costs for 2009

3,853 = 105% x (2009 total costs)

2009 total costs = 3,853 / 1.05 = 3,669

Step 3 - to the nearest £million

3,669 (£10,000s) = £37 million

Thus the correct answer is (D), £37 million

Q22 Which cost or costs on their own represented more than 17% of the total costs in 2010?

- (A) Labour and Production
- (B) Supply chain and I.T.
- (C) Labour and Supply chain
- (D) Supply chain, Labour and Production
- (E) Supply chain, Labour, Production and I.T.

The information that you need is shown in the table.

Step 1 – Calculate the total cost across the 4 quarters for 2010

Q1 total = 914

Q2 total = 915

Q3 total = 1,014

Q4 total = 1,010

2010 Total costs = 3,853

Step 2 – Calculate the % that each individual cost represented

Overheads = $(104 + 105 + 102 + 101) / 3,853 = 10.7\%$

Supply chain = $(186 + 174 + 162 + 166) / 3,853 = 17.9\%$

Labour = $(248 + 245 + 319 + 265) / 3,853 = 28.0\%$

I.T. = $(149 + 138 + 140 + 191) / 3,853 = 16.0\%$

Production = $(227 + 253 + 291 + 287) / 3,853 = 27.4\%$

Thus the correct answer is (D), Supply chain, Labour and Production

Q23 In which of the years shown was there a 3:2 ratio of IT to Overheads costs?

- (A) Cannot Say
- (B) 2006 and 2007
- (C) 2006, 2008 & 2010
- (D) 2007, 2008 & 2010
- (E) 2008 and 2009

The information that you need is shown in the graph and table.

Calculate the ratio of IT : Overheads costs for each of the 5 years shown:

2006: 18%:12% = 3:2

2007: 20%:15% = 4:3

2008: 21%:14% = 3:2

2009: 17%:15% = 1.13

2010: 618: 412 = 3:2

Thus the correct answer is (C), 2006, 2008 & 2010

Q24 If 2009's total costs were £250,000, what were the Production costs?

- (A) £80,000
- (B) £75,000
- (C) £70,000
- (D) £65,000
- (E) £60,000

The information that you need is shown in the graph.

Production costs = 26% = £250,000 x 26% = £65,000

Thus the correct answer is (D), £65,000

Q25 If the costs are put into order of decreasing size, in which two years is the order the same?

- (A) 2006 and 2007
- (B) 2006 and 2008
- (C) 2006 and 2010
- (D) 2007 and 2008
- (E) 2007 and 2009

Put each year's costs into size order:

2006 = Labour, Production, Supply Chain, IT, Overheads

2007 = Production, Labour, IT, Supply Chain, Overheads

2008 = Labour, Production, IT, Supply Chain, Overheads

2009 = Production, Labour, Supply Chain, IT, Overheads

Tip: *at this stage you could see that none of the years match so given that there is no "none of these" option you could gamble that 2010 will have the same order as one of the others, and thus go for answer (C).*

Carrying on for the remaining year:

2010 = Labour (1,077), Production (1,058), Supply Chain (688), IT (618), Overheads (412)

Thus the correct answer is (C), 2006 and 2010

UK Tourist data				
Country of origin	Annual Number of Tourists (1000s)	Total Spending (million)	Average Family Length of Stay (days)	Average Family Spend (£ per day)
Australia	2,200	435	5.2	236
Spain	1,300	410	2.8	116
Germany	660	380	4.6	148
U.S.A.	830	350	6.2	244
Italy	550	283	3.8	164

Q26 On average, families from which country of origin spend the most during a typical stay?

- (A) Australia
- (B) Spain
- (C) Germany
- (D) U.S.A.
- (E) Italy

Multiply each country of origin's Average Family Length of Stay by Average Family Spend

$$\text{Australia} = 5.2 \times 236 = 1,227.2$$

$$\text{Spain} = 2.8 \times 116 = 324.8$$

$$\text{Germany} = 4.6 \times 148 = 680.8$$

$$\text{U.S.A.} = 6.2 \times 244 = 1,512.8$$

$$\text{Italy} = 3.8 \times 164 = 623.2$$

Thus the correct answer is (D), U.S.A

Q27 On average, families from which of the countries shown spend the most and the least per typical stay?

- (A) Can't tell from the data
- (B) U.S.A. (most); Italy (least)
- (C) U.S.A. (most); Spain (least)
- (D) Australia (most); Italy (least)
- (E) Australia (most); Spain (least)

Step 1 – For each country of origin, calculate the amount spent per family by multiplying the Average Family Length of Stay by Average Family Spending. This question is very similar to the previous question so you can use those workings if you still have them.

$$\text{Australia} = 5.2 \times 236 = \text{£}1,227.20$$

$$\text{Spain} = 2.8 \times 116 = \text{£}324.80$$

$$\text{Germany} = 4.6 \times 148 = \text{£}680.80$$

$$\text{U.S.A} = 6.2 \times 244 = \text{£}1,512.80$$

$$\text{Italy} = 3.8 \times 164 = \text{£}623.20$$

Thus the correct answer is (C), U.S.A. (most); Spain (least)

Q28 Which of the following statements is True?

- (A) The ratio of German:Spanish tourists is 1:2
- (B) There are less Spanish tourists than German and Italian tourists combined
- (C) German families have the longest average length of stay
- (D) Total German tourist spending is more than 92% of Total Spanish tourist spending
- (E) There are over 4 times as many Australian tourists as Italian tourists

Go through each answer option to determine if it is True, as follows

The ratio of German:Spanish tourists is 1:2:

$$660:1300 = 33:65$$

So False

There are less Spanish tourists than German and Italian tourists combined:

$$1,300 \text{ (Spanish tourists)} > 660 + 550 \text{ (German and Italian tourists combined)}$$

So False

German families have the longest average length of stay:

$$\text{Longest average length of stay} = 6.2 \text{ (U.S.A)}$$

So False

Total German tourist spending is more than 92% of Total Spanish tourist spending:

$$92\% \text{ of Spanish tourist spending} = 92\% \times 410 = 377.2 (< 380)$$

So True

There are over 4 times as many Australian tourists as Italian tourists:

$$4 \times 550 = 2200 \text{ (but not more than 2,200)}$$

So False

Thus the correct answer is (D), Total German tourist spending is more than 92% of Total Spanish tourist spending

Q29 On average which of the following tour parties would spend the most per day?

- (A) 2 Australian families
- (B) 2 Spanish families
- (C) 3 German families
- (D) 3 U.S.A. families
- (E) 3 Italian families

Calculate the cost for each of the options:

$$2 \text{ Australian families} = 2 \times \pounds 236 = \pounds 472$$

$$2 \text{ Spanish families} = 2 \times \pounds 116 = \pounds 232$$

$$3 \text{ German families} = 3 \times \pounds 148 = \pounds 444$$

$$3 \text{ U.S.A. families} = 3 \times \pounds 244 = \pounds 732$$

$$3 \text{ Italian families} = 3 \times \pounds 164 = \pounds 492$$

Thus the correct answer is (D), 3 USA families

Q30 Approximately, what's the average daily spend per family for the 5 countries of origin shown?

- (A) £170
- (B) £180
- (C) £190
- (D) £200
- (E) Cannot tell from data

Whilst it might be tempting to calculate $(236 + 116 + 148 + 244 + 164) / 5 = £180$, this is not quite correct.

To be able to calculate the average spend per family, we would need to know how many families from each country there are. For example there might be a lot more families from one country which would distort the overall average.

Thus the correct answer is (E), Cannot tell from data