Capp Numerical Free Test

Solutions Booklet

Instructions

This numerical reasoning test comprises **8 questions**, and you will have to correctly answer as many as you can. Calculators are permitted for this test, and it is recommended you have some rough paper to work on.

You will have to think precisely and work thoroughly to perform well. The test does not have an overall time limit. Instead, the time it takes you to complete the test will be recorded.

Try to find a time and place where you will not be interrupted during the test. The test will begin on the next page.

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Practice Aptitude Tests

Flight times to destination airports

Departure airport
● Glasgow ● Edinburgh

Destination	Glasgow	Edinburgh
Benbecula	50	125
Kirkwall	70	75
Stornoway	60	70
Sumburgh	75	90

More destinations from Glasgow

Destination	Flight time	Fare
Barra	75	£50
Campbeltown	45	£40
Islay	45	£35
Manchester	70	£30
Tiree	60	£60

More destinations from Edinburgh

Destination	Flight time	Fare
Fair Isle	75	£45
Isle of Man	65	£80
John O Groats	65	£90
Norwich	80	£50

Q1 Rank the time taken for each journey from MOST to LEAST. (45 minutes are required for each connection at Glasgow and 1hr at Edinburgh).

Answer:

1st	= Norwich to Sumburgh
2nd	= Fair Isle to the Isle of Man
3rd	= Stornoway to Manchester
4th	= Islay to Kirkwall
5th	= Edinburgh to Benbecula

Step 1: For each flight, work out the route that must be taken, i.e. which airport the connection must be made at, as this is crucial to calculating the total journey time.
Fair Isle to the Isle of Man via Edinburgh
Stornoway to Manchester via Glasgow
Islay to Kirkwall via Glasgow
Norwich to Sumburgh via Edinburgh
Edinburgh to Benbecula direct

Step 2: Then, calculate the total journey time by simply adding the times given in the table and graph above. Remember that the connection times are different for Edinburgh and Glasgow, and that these would only apply to connecting flights.
Fair Isle to the Isle of Man via Edinburgh: 75 + 60 + 65 = 200
Stornoway to Manchester via Glasgow: 60 + 45 + 70 = 175
Islay to Kirkwall via Glasgow: 45 + 45 + 70 = 160
Norwich to Sumburgh via Edinburgh: 80 + 60 + 90 = 230
Edinburgh to Benbecula direct: 125

So, the little trip from East Anglia to the islands of Shetland is the journey which will take the longest amount of time, whereas the single flight to the one of the islands of the Outer Hebrides will have the shortest journey time.

Solution:

$$Flight\ time + Connection\ time + Flight\ time = Total\ journey\ time$$

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Q2 A party of 4 adults who shall fly Edinburgh to Isle of Man and back have decided to take up a promotional offer of 80% off their return flights and invited 1 friend along with them. How much of the cost of their airfare has been saved by taking up the offer despite paying for an extra person expressed as a percentage of the original fare?

Answer: 25%

Step 1: Calculate the cost of the airfare in the original scenario which involved 4 adults flying from Edinburgh to Isle of Man and back at £80 per flight per person.
Cost of 2 flights per person: £80 * 2 = £160
Cost of 2 flights for all 4 persons: £160 * 4 = £640

Step 2: Calculate the cost of the airfare in the second scenario. This time 5 people are travelling and the discount needs to be applied ONLY to the return fare.
Cost of outbound flights for all 5 persons: £80 * 5 = £400
Cost of return flights for all persons (incl. discount): £80 * 5 * 0.2 = £80
Total cost of outbound and return flights £400 + £80 = £480

Step 3: Deduct the airfare in the second scenario from the airfare in the first scenario to arrive at the difference between the two scenarios.
£640 - £480 = £160

Step 4: This needs to be expressed as a percentage of the original fare:
£160 / £640 * 100% = 25%

Solution:

$$Cost\ of\ flights\ for\ scenario\ 1 - Cost\ of\ flights\ for\ Scenario\ 2 = Savings$$

$$Savings/Cost\ of\ flights\ for\ scenario\ 1 * 100\% = Savings\ as\ percentage$$

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Average Property Prices

Company	Profits (2016)	Number of Employees	Average Employee Salary (£/year)
Ramco	£519,103	823	£26,400
Steel Inc.	£4,103,305	1,302	£32,304
Pimcorp	£523,595	282	£35,610
Marbleco	£179,223	667	£28,400
Servico	£872,408	801	£21,734
Translink	£42,648	98	£24,565

Q3   Given that every employee receives a 5% bonus at the end of the year, what was the total amount spent on wages by Servico in 2016?

Answer: £18,279,381

Step 1:   For this calculation, we will require the value of Servico's 'Average Employee Salary' (£/year) = £21,734.

Step 2:   Calculate the value increase of 5%, (*1.05) to get the salary with the bonus.

Step 3:   Now, multiply by the number of employees of Servico.

Solution: The calculation is as follows:

$$21,734 * 1.05 * 801 = 18,279,381$$

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Q4 What was Ramco, Pimcorp, Marbleco and Servico's combined profits as a percentage of Steel Inc's profits?
Round to the nearest whole percent. Enter your answer without a % sign.

Answer: 51%

Step 1: For this calculation, we must combined the profits of Ramco, Pimcorp, Marbleco and Servico.
519,103 + 523,595 + 179,223 + 872,408

Step 2: Then we divide this sum by the profits of Steel Inc = 4,103,305.
0.5104

Step 3: Then we convert to a percentage by multiplying by 100.
51.04%

Step 4: Round to the nearest whole = 51

Solution: The calculation is as follows:

$$\frac{(519,103+523,595+179,223+872,408)}{4,103,305} * 100 = 51.04 = 51$$

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Average Property Prices

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Q5 Rank the first three companies in the table from HIGHEST to LOWEST based upon their profit per employee.

Answer:
1st= Steel Inc
2nd= Pimcorp
3rd= Ramco

Step 1: We need to divide the profits by the number of employees.
Ramco = 519,103 / 823 = £630.74
Steel Inc = 4,103,305 / 1,301 = £3,151.54
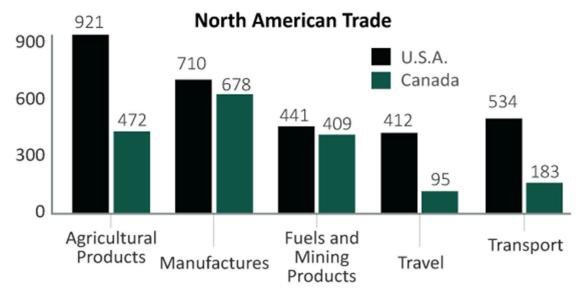Pimcorp = 523,595 / 282 = £1,856.72

Step 2: Then we rank this numbers into highest to lowest.

Solution: As calculations go, this is a very simple one once you've worked out which values to use.

$$519,103/823 = 630.74$$

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North American Trade

Total Import Value ($millions)

	2013	2014	2015	2016	2017
U.S.A.	113,530	117,423	124,361	133,264	137,253
Canada	87,315	91,253	94,521	97,154	101,536
Total	200,845	208,676	218,882	230,418	238,789

Q6 What was the percentage increase in the US and Canada's total imports from 2013 to 2017?
Round to the nearest percent. Enter your answer without a % sign.

Answer: 18.89%

Step 1: For this calculation, we will require the total value of the US and Canada imports in 2017 = 238,789. And the total value for 2013 = 200,845.

Step 2: In order to calculate the percentage increase, we need the difference between the two values.
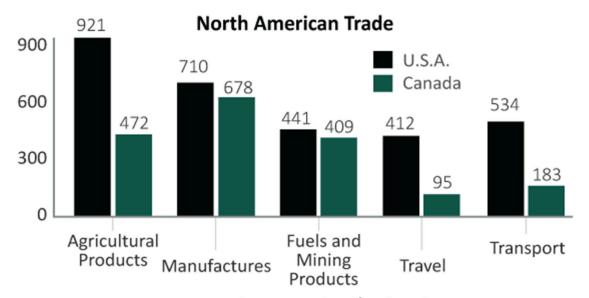238,789 – 200,845 = 37,944.

Step 3: Now, we divide by the original value, totally of 2013, and multiply by 100 to convert to a percentage.
37,944 / 200,845 * 100 = 18.89%

Step 4: Round to the nearest percent = 19

Solution: As calculations go, this is a very simple one once you've worked out which values to use.

$$\frac{238,789 - 200,845}{200,845} * 100 = 18.89\% = 19$$

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North American Trade

Bar chart showing North American Trade with U.S.A. (black) and Canada (green) values:
- Agricultural Products: U.S.A. 921, Canada 472
- Manufactures: U.S.A. 710, Canada 678
- Fuels and Mining Products: U.S.A. 441, Canada 409
- Travel: U.S.A. 412, Canada 95
- Transport: U.S.A. 534, Canada 183

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Canada	87,315	91,253	94,521	97,154	101,536
Total	200,845	208,676	218,882	230,418	238,789

Q7 What was the average difference between the US and Canada's imports across all 5 industries shown in the graph?

Answer: $236.2m

Step 1: For this calculation, we need to substract the difference for each sector between the US and Canada. In other words, the green coloured figures from the black coloured figures.
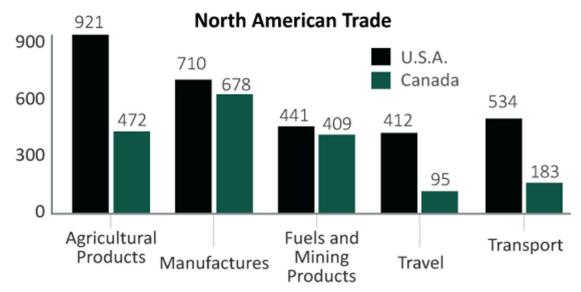
Step 2: Once we have these 5 separate numbers, we then add them together.

Step 3: Now we divide the sum by 5 to get the average.

Solution: This calculation is as follows:

$$\frac{(((921 - 472) + (710 - 678) + (441 - 409) + (412 - 95) + (534 - 183))}{5} = 236.2m$$

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North American Trade

Total Import Value ($millions)

	2013	2014	2015	2016	2017
U.S.A.	113,530	117,423	124,361	133,264	137,253
Canada	87,315	91,253	94,521	97,154	101,536
Total	200,845	208,676	218,882	230,418	238,789

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Q8 Calculate the total export value (US and Canada) of fuels and mining products as a percentage of the total export value of manufactures.

Answer: 61.24%

Step 1: For this calculation, we will require the value of Fuels and Mining Products, to which we add together the values of the US and Canada.
441 + 409 = 850

Step 2: Then we divide this by the sum of the US and Canada's Manufactures values.
710 + 678 = 1,388

Step 3: Now, we divide these two values.
850 / 1,388 = 0.61239

Step 4: Finally, we multiple by 100 in order to convert to a percentage.
0.6124 * 100 = 61.24%

Solution: As calculations go, this is a very simple one once you've worked out which values to use.

$$\frac{(441 + 409)}{(710 + 678)} * 100 = 61.24\%$$

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-- End of Test --

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