

Question on Page 12 – no, yes, no

Part 1

It talks about the seasonally adjusted values for used cars and trucks and those for new vehicles. So, we need to only look at 2 rows (new vehicles and used cars and trucks) and all columns between March 2010 and September 2010 (7 months). We are asked whether the for the majority of months, seasonally adjusted values for old cars and trucks is lesser than those for new vehicles. Since it talks about majority, we need to tabulate or compare values till we get up to 4 yeses or nos.

New Vehicles Used cars and trucks

March 2010 $0.1 < 0.5$ No

April 2010 $0.0 < 0.2$ No

May 2010 $0.1 < 0.6$ No

June 2010 $0.1 < 0.9$ No

Since, we have got four NOs, we know that for the majority of months the answer is no. Since, we cannot infer the statement in question, the answer is no for this question.

The correct answer is No.

The question asks about the magnitude of the changes in the two categories, so we need to compare them, month by month, to see which changed more and which changed less. For March 2010, the magnitude of change for used cars and trucks was 0.5, but only 0.1 for new vehicles. For that month, then, the magnitude of change was larger for the used cars and trucks. Compare the other months. In each case, the magnitude of change (the distance from zero) is larger for used cars and trucks. (This was true even in September 2010—the change was negative, but it was -0.7, which is 0.7 units away from 0. The magnitude of change for new cars was only 0.1.)

The statement says that the change for used cars and trucks was in most cases less in magnitude, but that's not true. During all of the months in question, however, the change in magnitude (from zero) for used cars and trucks was greater.

Select No for statement 1.

Part 2

The number at the intersection of the "Mar 2010" column and the "All items" row is 0.1. As the table title and the multicolumn header indicate, this means the seasonally adjusted CPI-U for all items collectively was 0.1% higher in March 2010 than it was in the preceding month.

The correct answer is Yes.

This time, the statement is directing me to the "all items" category in the month-by-month (adjusted) timeframe. That's right at the top of the table. We're specifically asked about March 2010 compared to the previous month, but the table doesn't include the previous month, so how can it tell us anything at all about February?

Read the labels! Right above the months, the table says Seasonally adjusted changes from preceding month. In other words, the figure for March 2010 is based upon the change from February 2010. That change is positive, so it is true that the number for March is higher than the number for February.

Select Yes for statement 2.

Part 3

The only seasonally unadjusted changes in prices shown in the table are those in the final column, which are for the whole 12-month period ending September 2010. The table contains no information about seasonally unadjusted changes in prices between any specific month and the preceding month.

The correct answer is No.

This one is tricky. It needs us to look for the seasonally **unadjusted** value which is the last column here. However, it wants us to compare the last column price change for new vehicles in august over preceding month with the last column price change of food away from home in the same period. We are not given this data and thus we cannot test the validity of this statement from the given data. Note here, we are not asked to confirm whether the data is right or not. We are asked to confirm whether the data can be inferred from the given data or not. Since, we cannot infer the data from the given information, the answer is no.

Read carefully! What data do they want now? Seasonally UNadjusted this time, not adjusted! The only data we have for the unadjusted category is based on the 12 months ended Sep 2010—we don't have month-by-month data! Therefore, we can't tell anything at all about what happened in August 2010 vs. July 2010—not for the UNadjusted data.

Note something very tricky. If you gloss over the Un in the word unadjusted, you might just go check the Aug and Jul columns for new vehicles and food away from home. For new vehicles, the change was 0.3. For food away from home, the change was 0.3. Those two numbers are the same—and so you would pick Yes, and you would fall into the trap. We don't have any unadjusted data for the month of August alone.

Select No for statement 3.

Question on Page 13 – false, false, true

Part A.

Easy answer: any value can be small or large in averages, so we can't be sure. So, the answer is **False**.

Detailed solution:

Year 2000

$$52.8x + 44.2y + 58.5z = 50.6(x + y + z)$$

$$\text{Or } 528x + 442y + 585z = 506(x + y + z) \quad \text{Or}$$

$$22x + 79z = 64y \quad \text{Take } z = 64, 22x = 64(y - 79)$$

$$\text{So, } y > 79 \quad \text{and} \quad (y - 79) \text{ must be a multiple of 22 } (11 \times 2)$$

$$\text{So, } (y - 79) \text{ must be a multiple of 11}$$

$$\text{Let's take } y - 79 = 11 \quad \text{So, } y = 90$$

$$32x = 64 \times 11$$

$$\text{If } y = 90, \text{ then } x = 32$$

So, $x = 32$, $y = 90$, and $z = 64$ are definitely possible

So, y can be greater than both x and z

Part B

Only percentages are given: we can't comment on the numbers at all.

Although the percentage of students enrolled in Province A who were female decreased from year 2000 to year 2008, the information provided would be consistent with there being a large increase in total enrollment over this period. For example, as far as we know, the increase could have been 10%, 20%, or as large as we may imagine. If this percentage increase in total enrollment was large enough, then **more** women would have been enrolled in the fall of 2008 than in the fall of 2000.

The correct answer is F.

Again, this is a trap designed for a rookie test-taker who does not consider the difference between a percent and an actual number of something. We cannot make any such year-to-year comparison without a number attached to the total student enrollment (or some part therein, such as the *number* of female or male students at a given university) for both years in discussion.

Conclusion: The statement cannot be true based on the information provided, so it is **FALSE**.

Part C

Women Enrolled, as a Percent of Total Enrollment

| Fall | University X | University Y | University Z | Province A |
|------|--------------|--------------|--------------|------------|
| 2000 | 52.8 | 44.2 | 58.5 | 50.6 |
| 2001 | 53.1 | 44.1 | 58.9 | 50.7 |
| 2002 | 53.6 | 44.0 | 55.8 | 50.8 |
| 2003 | 53.3 | 43.6 | 58.6 | 50.5 |
| 2004 | 53.0 | 43.9 | 58.1 | 50.5 |
| 2005 | 52.5 | 43.7 | 58.3 | 50.2 |
| 2006 | 52.2 | 43.8 | 58.1 | 50.1 |
| 2007 | 52.0 | 43.2 | 57.8 | 49.7 |
| 2008 | 51.4 | 43.8 | 58.3 | 49.7 |

With the table sorted according to the year, we find that, for each of the 3 universities, the percentages in the table are not listed in ascending order. For University X, the percentage for year 2002 was 53.6, while the percentage for the next year, 2003, was 53.3. For University Y, the percentage for year 2000 was 44.2, while the percentage for year 2001 was 44.1. And for University Z, the percentage for year 2001 was 58.9, while the percentage for year 2002 was 55.8. We thus see that each of the universities had at least one decrease in the percentage of female enrollment from one fall to the next.

The correct answer is T.

Question on Page 14 **yes, no, yes**

Part 1

| Vegetable | Cooked (yes/no) | Percent water | Energy (kcal) | Protein (g) | Total fat (g) | Carbohydrate (g) | Total fiber (g) |
|--------------------|-----------------|---------------|---------------|-------------|---------------|------------------|-----------------|
| Broccoli | no | 91 | 25 | 3 | trace | 5 | 2.6 |
| Carrots | no | 88 | 47 | 1 | trace | 11 | 3.3 |
| Spinach | no | 92 | 7 | 1 | trace | 1 | 0.8 |
| Summer squash | no | 94 | 23 | 1 | trace | 5 | 2.1 |
| Sweet green pepper | no | 92 | 40 | 1 | tract | 10 | 2.7 |
| Asparagus | yes | 92 | 43 | 5 | 1 | 8 | 2.9 |
| Beets | yes | 87 | 75 | 3 | trace | 17 | 3.4 |
| Broccoli | yes | 91 | 44 | 5 | 1 | 8 | 4.5 |
| Carrots | yes | 87 | 70 | 2 | trace | 16 | 5.1 |
| Corn | yes | 77 | 131 | 5 | 1 | 32 | 3.9 |
| Green beans | yes | 89 | 44 | 2 | trace | 10 | 4.0 |
| Mustard greens | yes | 94 | 21 | 3 | trace | 3 | 2.8 |
| Pak Choi | yes | 96 | 20 | 3 | trace | 3 | 2.7 |
| Spinach | yes | 91 | 41 | 5 | trace | 7 | 4.3 |
| Summer squash | yes | 94 | 36 | 2 | 1 | 8 | 2.5 |

After sorting the table, we have uncooked (protein) 1, 1, 1, 1, 3: median = 1

Cooked (protein) 2, 2, 2, 3, 3, 3, 5, 5, 5, 5: median = 3

Sorting the table on *Cooked (yes/no)* reveals that there are 5 uncooked vegetables listed, 4 of which provide 1 g of protein and 1 of which provides 3 g of protein; furthermore, there are 10 cooked vegetables, 3 of which provide 2 g, 3 of which provide 3 g, and 4 of which provide 5 g of protein. When the numbers of grams of protein provided by the 5 uncooked vegetables are listed in order from least to greatest—1, 1, 1, 1, 3—the median number of grams of protein is given by the 3rd value in the list, 1. When the numbers of grams of protein provided by the 10 cooked vegetables are listed in order from least to greatest—2, 2, 2, 3, 3, 3, 5, 5, 5, 5—the median number of grams of protein is given by the arithmetic mean of the 5th and 6th values in the list, $\frac{3 + 3}{2}$, or 3. Therefore the median amount of protein provided by the uncooked vegetables, 1 g, is equal to $\frac{1}{3}$ the median amount of protein provided by the cooked vegetables. The correct answer is **Yes**.

Part 2

| Vegetable | Cooked (yes/no) | Percent water | Energy (kcal) | Protein (g) | Total fat (g) | Carbohydrate (g) | Total fiber (g) |
|--------------------|-----------------|---------------|---------------|-------------|---------------|------------------|-----------------|
| Spinach | no | 92 | 7 | 1 | trace | 1 | 0.8 |
| Pak choi | yes | 96 | 20 | 3 | trace | 3 | 2.7 |
| Mustard greens | yes | 94 | 21 | 3 | trace | 3 | 2.8 |
| Summer squash | no | 94 | 23 | 1 | trace | 5 | 2.1 |
| Broccoli | no | 91 | 25 | 3 | trace | 5 | 2.6 |
| Spinach | yes | 91 | 41 | 5 | trace | 7 | 4.3 |
| Summer squash | yes | 94 | 36 | 2 | 1 | 8 | 2.5 |
| Asparagus | yes | 92 | 43 | 5 | 1 | 8 | 2.9 |
| Broccoli | yes | 91 | 44 | 5 | 1 | 8 | 4.5 |
| Sweet green pepper | no | 92 | 40 | 1 | trace | 10 | 2.7 |
| Green beans | yes | 89 | 44 | 2 | trace | 10 | 4.0 |
| Carrots | no | 88 | 47 | 1 | trace | 11 | 3.3 |
| Carrots | yes | 87 | 70 | 2 | trace | 16 | 5.1 |
| Beets | yes | 87 | 75 | 3 | trace | 17 | 3.4 |
| Corn | yes | 77 | 131 | 5 | 1 | 32 | 3.9 |

32

$$(8 + 8) / 2 = 8$$

$$32 = 8 \times 4, \text{ not } 8 \times 3$$

Sorting on *Carbohydrate (g)* reveals that cooked corn provides the largest amount of carbohydrate of the vegetables listed, at 32 g. The median amount of carbohydrate for the other 14 vegetables listed is given by taking the arithmetic mean of the 7th and 8th values listed—that is, the arithmetic mean of the values for cooked asparagus and cooked broccoli, $1/2 (8 + 8)$ g, or 8 g. Since $32 = 4(8)$, the amount of carbohydrate per serving of cooked corn is exactly 4—not 3—times the median for the other 14 vegetable options listed. The correct answer is **No**.

Part 3

| Vegetable | Cooked (yes/no) | Percent water | Energy (kcal) | Protein (g) | Total fat (g) | Carbohydrate (g) | Total fiber (g) |
|--------------------|-----------------|---------------|---------------|-------------|---------------|------------------|-----------------|
| Spinach | no | 92 | 7 | 1 | trace | 1 | 0.8 |
| Summer squash | no | 94 | 23 | 1 | trace | 5 | 2.1 |
| Summer squash | yes | 94 | 36 | 2 | 1 | 8 | 2.5 |
| Broccoli | no | 91 | 25 | 3 | trace | 5 | 2.6 |
| Pak choi | yes | 96 | 20 | 3 | trace | 3 | 2.7 |
| Sweet green pepper | no | 92 | 40 | 1 | trace | 10 | 2.7 |
| Mustard greens | yes | 94 | 21 | 3 | trace | 3 | 2.8 |
| Asparagus | yes | 92 | 43 | 5 | 1 | 8 | 2.9 |
| Carrots | no | 88 | 47 | 1 | trace | 11 | 3.3 |
| Beets | yes | 87 | 75 | 3 | trace | 17 | 3.4 |
| Corn | yes | 77 | 131 | 5 | 1 | 32 | 3.9 |
| Green beans | yes | 89 | 44 | 2 | trace | 10 | 4.0 |
| Spinach | yes | 91 | 41 | 5 | trace | 7 | 4.3 |
| Broccoli | yes | 91 | 44 | 5 | 1 | 8 | 4.5 |
| Carrots | yes | 87 | 70 | 2 | trace | 16 | 5.1 |

When the table is sorted on *Total fiber (g)*, the first 8 vegetables listed are those having total fiber less than 3.0 g. Among these 8, uncooked sweet green pepper has the greatest amount of carbohydrate per serving, at 10 g. Hence, none of these 8 vegetables has more than 10 g of carbohydrate per serving. The correct answer is **Yes**.

Question on Page 16

neither directly affirms nor directly contradicts | 1995–2005

Part 1

The scale on the graph's vertical axis represents the percentage of a country's population who are international immigrants. The line representing France is relatively flat, showing that the percentage of the people in France who were international immigrants did not change much from 1980 to 2005. But the graph does not indicate whether the number of people constituting France's total population changed significantly during that period. If France's population did change significantly, while the percentage of that population consisting of international immigrants remained about the same, then the graph would indicate that the number of international immigrants also changed significantly during that period. On the other hand, if France's population did not change significantly, then the graph would indicate that the number of international immigrants did not either. Thus, the graph neither directly affirms nor directly contradicts the statement that the *number* of international immigrants in France did not change significantly from 1980 to 2005.

The correct answer is *neither directly affirms nor directly contradicts*.

Part 2:

In the graph, the slope of the line representing any country represents that country's rate of growth in international immigrants as a percent of total population, with a steeper upward slope from left to right indicating faster growth. In both the section of the graph representing the period from 1980 to 1985 and the section representing the period from 1980 to 1995, the line representing the United States slopes upward from left to right more steeply than each of the other lines, indicating that the rate of growth in international immigrants as a percent of total population was greater in the United States than in each of the other nations during those periods. But in the section of the graph representing the period from 1995 to 2005, the line representing Ireland slopes upward from left to right more steeply than the line representing the United States does, indicating that the rate of growth in international immigrants as a percent of total population was greater in Ireland than in the United States during the interval from 1995 to 2005.

The correct answer is *1995–2005*.

Question on Page 17

Paper check / 21%

Part 1

of paper check transactions in 2006: 24

of paper check transactions in 2009: 30

% increase = $(6/24) * 100 = 25\%$, so **paper check** is the correct answer.

Part 2

$$(1.1) [22 \times A_1] = 20 \times A_2$$

So, $A_2/A_1 = 24.2/20 = 1.21$, so 21% increase

Question on Page 18: 5th, 10000

Part 1

The graph shows the projected cumulative net income for New Zealand grape and truffle crops. The least cumulative net income from truffles is represented by the lowest mark on the corresponding line in the graph. The lowest point occurs at the end of the fifth year since planting, when the projected cumulative net income from truffles is approximately negative NZ\$34,000.

The correct answer is **5th**.

Part 2

End of year 7, the value = -10

End of year 11, the value = 6

Total increase = 16 over 4 years

So, average increase per year = 4

$6 + 4 = 10$, so 10000

Given the sentence to be completed, it is first necessary to calculate the projected growth rate during years 8 through 11. At the end of year 7, the cumulative net income for grapes is projected to be approximately negative NZ\$10,000/ha. At the end of year 11, the cumulative net income is projected to be approximately NZ\$6,000/ha. This represents a total increase of NZ\$16,000/ha from the beginning of year 8 to the end of year 11 (4 years), or an approximate increase in net income of NZ\$4,000/ha/year. Given that the cumulative net income for grapes is projected to be approximately NZ\$6,000/ha at the end of year 11, if this income continues to grow at a rate of approximately NZ\$4,000/ha/year, then the cumulative net income for grapes at the end of year 12 would be approximately NZ\$10,000/ha.

The correct answer is 10,000.

Question on Page 19: $x \leq 2$ $10 < x \leq 15$

Part 1

| Distance Range | $d \leq 2$ | $2 < d \leq 5$ | $5 < d \leq 10$ | $10 < d \leq 15$ | $d > 15$ |
|--|------------|----------------|-----------------|------------------|----------|
| Number walking | 30 | 10 | 6 | 0 | 0 |
| Total: 46, median = average of 23 rd and 24 th value | | | | | |

R01: Recognize

The median round-trip distance of the walkers can be found by first determining from the bar graph how many people walked each distance. The results are recorded in the table:

| Distance Range | $d \leq 2$ | $2 < d \leq 5$ | $5 < d \leq 10$ | $10 < d \leq 15$ | $d > 15$ |
|----------------|------------|----------------|-----------------|------------------|----------|
| Number walking | 30 | 10 | 6 | 0 | 0 |

The total number of people walking is $30 + 10 + 6 = 46$. Since 46 is an even number, the median distance walked will be the average (arithmetic mean) of the distance walked by the 23rd and 24th walkers, when the distances are listed from least to greatest. Because 30 people walked a distance less than or equal to 2 km, both the 23rd and 24th walkers will be included in this group. Thus, the median is within the distance range $d \leq 2$, since the average of two numbers that are less than or equal to 2 will be a number less than or equal to 2.

The correct answer is $x \leq 2$.

Part 2

| Distance Range | $d \leq 2$ | $2 < d \leq 5$ | $5 < d \leq 10$ | $10 < d \leq 15$ | $d > 15$ |
|------------------------------|------------|----------------|-----------------|------------------|----------|
| Number taking public transit | 2 | 17 | 30 | 17 | 37 |

Total = 103, median = 52nd value

The total number of people taking public transit is $2 + 17 + 30 + 17 + 37 = 103$. Since 103 is an odd number, the median distance traveled will be that of the middle traveler (the 52nd) when the distances are listed in order. Counting the number of travelers from least to greatest, there are $2 + 17 + 30 = 49$ travelers for whom $d \leq 10$. Thus, the distance traveled by the 52nd traveler is $10 < d \leq 15$.

The correct answer is $10 < x \leq 15$.

Question on Page 22

Runoff from roads is often absorbed by farmland

Sand is much less effective than salt at making roads safe to drive in winter conditions.

There is insufficient information to link drinking water to the agriculture official's argument, therefore the third option is eliminated.

Part 1

While the high cost of removing salts from soil in abandoned salt yards could strengthen the official's case, additional information would need to be presented. For instance, if additional salt yards had been proposed, then switching to sand as a road treatment method could prevent further environmental damage. In the absence of such additional information, the high cost of removing salts from soil in abandoned salt yards does not, in itself, strengthen the official's case significantly.

The statement that most strengthens the official's case is that runoff from roads is often absorbed by farmland. Unlike the statement about salt yards, this indicates that maintaining the use of salt as a road treatment presents an immediate consequence for food production—a consequence the agriculture official wants to avoid.

The correct answer is Runoff from roads is often absorbed by farmland.

Part 2

The high number of road accidents attributable to untreated roads in winter could weaken the case if the official had proposed not treating the roads at all, but as the agriculture official offered sand as an alternative, this option does not affect the official's proposal. If true, the statement comparing the effectiveness of sand as a road treatment to the effectiveness of salt provides an argument against the use of sand that the official's argument does not address.

The correct answer is Sand is much less effective than salt at making roads safe to drive in winter conditions.

Question on Page 23

A, E

The task in this question is to find a characteristic held by fewer than half of a certain subset of the cell phones in stock at the store. The first characteristic listed (A), *are touch-screen-only phones*, is held by fewer than half of all the phones in stock but not necessarily of any subset of those phones—since it is possible that more touch-screen-only phones than dial pad phones are available to be *sold at a discounted price*. The second characteristic (B), *have screens 8 cm or larger*, is held by fewer than half the dial pad phones, but that subset is not one of the options available. It is not possible to make a determination about the third characteristic (C), *are purchased without a service contract*, because there is no information about purchases—only the phones that are available at the store. The fourth characteristic (D), *are available at a discounted price with a service contract*, is held by most phones in stock. There is no indication that it is true of fewer than half of any subset. The fifth characteristic (E), *are packaged with fewer than two accessories*, is held by fewer than half dial pad phones and also true of fewer than half *touch-screen only phones*. It is not necessarily held by fewer than half of any subset of those phones, however. (For example, most touch-screen-only phones *have screens 8 cm or larger*, but it does not follow that fewer than half of *those* phones are packaged with fewer than two accessories; more than half of them could be packaged this way, and that characteristic would still be held by less than half of all touch-screen-only phones.) Therefore, the subset that fits the criteria is *are touch-screen-only phones* (blank #1), and the characteristic that is true of fewer than half of those phones is *are packaged with fewer than two accessories* (blank #2).

The correct answer is A, *are touch-screen-only phones*.

As explained above, the only characteristic listed that is true of fewer than half *touch-screen-only phones* is *are packaged with fewer than two accessories*.

The correct answer is E, *are packaged with fewer than two accessories*.

Question on Page 24

C, A

First, a two second summary of archaeologist claim: Because porcelain cups have unique compositions, archaeologists can use composition analysis to determine where the next discovered cup comes from.

So looking at the statements, I try to eliminate the statements that do not support the archaeologist's claim:

- a) RELEVANT: Says that they have previous porcelain cups, so these are the cups that they could use for their composition analysis
- b) ELIMINATE: Cups that are not made of porcelain do not support his claim
- c) RELEVANT: The next cup has to be porcelain, archaeologist only talks about identifying cups that are porcelain
- d) ELIMINATE: Hurts archaeologist claim because it introduces reasoning to why composition analysis might not lead to correct origin of cup
- e) ELIMINATE: Hurts archaeologist claim because composition analysis might not point to correct origin if two origins produce the same type of composition
- f) ELIMINATE: Seems like irrelevant information

So between A and C, it's not too hard to tell which one is the archaeologist assumptions and which one is possible fact. The archaeologist is assuming that they can find out where the next cup comes from because the next cup will be porcelain, and they can use composition analysis. The fact that all of the cups they have previously found were porcelain strengthens the assumption that the next one will be porcelain as well.

If you reversed it, and said that the assumption is all of the past cups found were porcelain, the possible fact that the next one will be porcelain does nothing to strengthen your assumption.

Question on Page 26

9 / 7

Day 1: S1 (A only) S2 (A and D) S4 (A and D) or Day 1: 1, 2, 4

Day 2: S1 (A only) S3 (A and D) S5 (A and D) or Day 2: 1, 3, 4

Day 3: S2 (A and D) S3 (A and D) S4 (A and D) Day 3: 2, 3, 5

Each sequence will have 1 flight arrive in A and S1 doesn't have D flights

City A: 9 flights (A is available in each sequence) | City D is not in S1 (7 flights)

Question on Page 26: 250 | 200

Part 1

50 small tokens already there.

200 beverages purchased using small tokens, so $200 \times 3 = 600$ small tokens inserted

200 beverages purchased using large tokens, so 200 large tokens inserted (equivalent to $200 \times 5 = 1000$ small tokens)

$200 \times 2 = 400$ small tokens returned

So, 250 small tokens remain, along with 200 large tokens

The machine contained only 50 small tokens following its last service. Employees are equally likely to pay for a beverage from this machine with 1 large token as they are with 3 small tokens, so it is expected that out of 400 beverages sold, 200 will be purchased with 3 small tokens. These purchases will account for a total of $200(3) = 600$ small tokens added to the machine. The other 200 beverages will be purchased with 1 large token, and for each of these purchases, 2 small tokens will be removed from the machine. Therefore, the purchases with a large token result in a total of $200(2) = 400$ small tokens removed from the machine. The total number of small tokens expected to be in the machine today is thus $50 + 600 - 400 = 250$.

The correct answer is 250.

Part 2

The machine contains no large tokens following its last service. As explained in the discussion of R01, 200 employees are expected to purchase a beverage using 1 large token, so 200 large tokens would be expected to be in the machine today.

The correct answer is 200.

Question on Page 28

$$5500/R$$

$$\left(\frac{100 + S}{100 + F}\right) R$$

Student to faculty ratio = R

$$\text{Students} = 5500$$

$$\text{So, } 5500/\text{Faculty} = R$$

$$\text{So Faculty} = 5500/R$$

$$\text{Students after } S\% \text{ change} = [(100+S)/100] \times 5500$$

$$\text{Faculty after } F\% \text{ change} = [(100+F)/100] \times 5500/R$$

$$\text{Final ratio} = \left(\frac{100+S}{100+F}\right) R$$

Question on Page 29

14, 42

$$14/140 + 42/70 = 1/10 + 3/5 \text{ hours}$$

$$= 6 \text{ min} + 36 \text{ min} = 42 \text{ min}$$

Part 1

We are asked to determine the lengths of two segments of an automobile test track. The passage states that a car traveled Segment A at a constant rate of 140 km/h and traveled Segment C at a constant rate of 70 km/h, which indicates that it took the car twice as much time to cover a given unit of distance in Segment C as it took to cover the same distance in Segment A. The passage further states that the length of Segment C is 3 times the length of Segment A. Because the car took twice the time to cover a given distance in Segment C as in Segment A, and because Segment C was 3 times as long as Segment A, it can be further determined that the car spent 6 times as much time traveling Segment C as it did while traveling on Segment A. The passage indicates that it took a total of 42 minutes for the car to travel both segments A and C, and 42 minutes is equal to 0.7 h (42/60). Therefore, given that the car spent 6 times as much of the total combined time on Segment C as it did on Segment A, it can be calculated that the car spent 0.1 h on Segment A and 0.6 h on Segment C. Because we know that the car was traveling at 140 km/h for 0.1 h on Segment A, we can determine that Segment A was 14 kilometers long. **The correct answer is 14.**

Part 2

As noted in the analysis above, the car spent 0.6 h traveling Segment C. Because we know that the car was traveling at 70 km/h for 0.6 h on Segment C, we can determine that Segment C was 42 kilometers long. **The correct answer is 42.**

MSR Question-Set

Q. 1 (page 31)

No / No / Yes

Part 1

Note on the **Loan Table tab** in the zero-interest column that only 25.3% of zero-interest rate loans had a fixed duration. We can infer that 74.7% of zero-interest loans did not have a fixed duration. But at most 5.6% of zero-interest loans in total had any of the three types of security (and some or all of those loans may have had a fixed duration). Therefore, it would NOT generally be accurate to say that a lender who offered one of the zero-interest loans gave up a fixed duration of repayment in exchange for security.

The correct answer is No.

Part 2

Note on the **Loan Table tab** in the zero-interest column that at most 5.6% of zero-interest rate loans in total had any of the three types of security (it could be less than 5.6% because some loans might have more than one of the types of security). So, the vast majority of lenders who offered one of the zero-interest rate loans—and therefore gave up interest payments—received no form of security. Therefore, it would NOT be accurate to say that a lender who offered one of the zero-interest loans gave up interest payments in exchange for security.

The correct answer is No.

Part 3

On the **Credit Discussion tab**, the second paragraph states that with zero-interest loans, borrowers would repay principal and also provide some non-monetary resource in lieu of interest. Therefore, it would be accurate to say that a lender who offered one of the zero-interest rate loans gave up interest payments in exchange for access to some other resource.

The correct answer is Yes.

Q. 2 (page 32)

Yes / no / no

Part 1

The table on the **Loans Table tab** indicates that 363 of the loans in the survey were zero-interest rate loans and 300 of the loans in the survey were positive-interest rate loans. Therefore, if a loan in the survey is chosen at random, with no prior knowledge of the village, the probability that the loan is a zero-interest rate loan is approximately 55%. Consider the graph on the **Interest Rates tab**. There were two villages with mean annual interest rates in 1935 greater than 45%, and in each of them greater than 80% of the loans in the village were zero-interest loans, which is greater than the percentage of all the loans that are zero-interest rate loans. Therefore, if a loan in the survey is considered at random, knowing that the loan was in a village having a mean annual interest rate in 1935 greater than 45% is a factor that increases the probability that the loan is a zero-interest rate loan.

The correct answer is Yes.

Part 2

The **Credit Discussion tab** indicates that in lieu of interest, the lender of a zero-interest rate loan expects to receive from the borrower non-monetary resources such as land, labor, or draft services. Therefore, if a loan in the survey is considered at random, knowing that the borrower would be unable to supply land, labor, or draft services in the future makes it LESS probable that the loan is a zero-interest rate loan.

The correct answer is No.

Part 3

The table on the **Loans Table tab** indicates that 363 of the loans in the survey were zero-interest rate loans and 300 of the loans in the survey were positive-interest rate loans. Therefore, if a loan in the survey is chosen at random, with no prior knowledge of the village, the probability that the loan is a zero-interest rate loan is approximately 55%. Consider the graph on the **Interest Rates tab**. There was exactly one village with mean annual interest rates in 1935 less than 20%, and in that village less than 25% of loans were zero-interest rate loans, which is less than the percentage of all the loans that were zero-interest rate loans. Therefore, if a loan in the survey is considered at random, knowing that the loan was in a village having a mean annual interest rate in 1935 that was less than 20% makes it LESS probable that the loan is a zero-interest rate loan.

The correct answer is No.

Q. 3 Ans. A (page 33)

The table on the indicates that there were 363 zero-interest rate loans and only 300 positive-interest rate loans.

The correct answer is A greater number of zero-interest rate loans than positive-interest rate loans were negotiated.

MSR Question-Set

Q. 1 (page 34): I / N / N

According to the environmental scientist, unlike placer-deposit mines, modern commercial lode-deposit mines are massive operations. Given that the Grasberg mine is the largest in the world, it is more likely to be a lode-deposit mine than a placer-deposit mine. Again according to the environmental scientist, unlike mining lode deposits—mining placer deposits does not usually involve crushing rock and using chemicals to extract gold, which implies that these are typical practices for mining lode deposits.

As mentioned in the para by the Environmentalist: "Because—unlike mining lode deposits—mining placer deposits does not usually involve crushing rock and using chemicals to extract gold, the environmental impacts are generally less than those of mining lode-deposits.". Also Grasberg is the largest mine in the world, implying it would have sufficient amount of lode deposits.

The correct answer is Implied.

As discussed in the analysis above, the environmental scientist's statements suggest that the Grasberg mine is most likely a lode-deposit mine. Although the environmental scientist states that on average, such mining operations process approximately 130 kilograms of raw ore to produce 1 gram of pure gold, there is no information given to suggest that production at the Grasberg mine approximates that average.

The correct answer is Not implied.

As discussed in the analysis above, the environmental scientist's passage implies that the Grasberg mine is most likely a lode-deposit mine. But the prospector's passage implies only about placer deposits that they are always associated with rivers. There is no mention of a necessary relationship between lode deposits and rivers. Therefore, the information provided does not imply that the Grasberg mine was located at or adjacent to a river.

The correct answer is Not implied.

Q. 2 (page 35): NS / NS / S

The environmental scientist makes this claim in the third sentence of the second paragraph but does not provide evidence anywhere to support this claim.

The correct answer is Not supported.

The environmental scientist makes this claim in the final sentence of the first paragraph but does not provide evidence anywhere to support this claim.

The correct answer is Not supported.

The environmental scientist makes this claim in the final sentence of the second paragraph and then indicates that modern commercial lode-deposit mines process up to 180,000 metric tons (1 metric ton = 1,000 kilograms) of raw ore per day, helping to illustrate the magnitude of such operations. Therefore, the passage offers specific evidence to support the claim that modern commercial lode-deposit mines are massive operations. as mentioned in the statement by the environmentalist: "Unlike placer-deposit mines, modern commercial lode-deposit mines are massive operations, some displacing and processing up to 180,000 metric tons (1 metric ton = 1,000 kilograms) of raw ore per day."

The correct answer is Supported.

Q. 3 (page 36) Ans. C

130 kg for 1 gm (normally) $130/20 = 6.5$ for 1 gm

Fastest: 180,000 MT = 180,000,000 kg per day

$180,000,000 / 6.5 = 27,680,000$ grams (27.68 metric tons) of pure gold per day

$100/27.68 = 3.61$ days

The environmental scientist indicates that, on average, lode-deposit mines process 130 kilograms of raw ore to produce 1 gram of pure gold. If this lode deposit has 20 times the average concentration of gold, it will take $130/20$, or 6.5, kilograms of raw ore to produce 1 gram of pure gold. The fastest rate of processing listed in the passage is 180,000 metric tons (or 180,000,000 kilograms) of ore per day. At that rate, this mine would be able to produce $180,000,000/6.5$ grams, which is approximately 27,680,000 grams (27.68 metric tons), of pure gold per day. Therefore, it would take $100/27.68$ days, which is approximately 3.61 days, for this mine to produce 100 metric tons of pure gold working at this rate, which is greater than 3 but less than 4 days.

The correct answer is C.

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