GMAT® Integrated Reasoning

Data

Article

The expenses related to sponsoring a conference can be immense. An organization sponsoring a conference can recoup these expenses through registration fees and partnership with the host hotel. As part of the partnership, the host hotel sets aside a block of rooms for conference attendees, with rooms available at a slightly higher-than-normal rate.

While most conference attendees prefer to stay in the host hotel, they often follow an alternate strategy to avoid the extra cost of reserving a room within the block at the host hotel. Some attendees reserve rooms outside the host hotel—the ROHH strategy. Others reserve rooms outside the block—the ROB strategy.

Conference sponsors have succeeded in countering these strategies by increasing the conference registration fee by a fixed amount and then offering an equivalent registration fee discount to attendees who book rooms in the block. A study has shown that if this registration discount is equal to at least half the potential savings of an attendee's particular cost-saving strategy, the attendee is much more likely to reserve a room within the block.

Weekend Conferences

Ten conferences are scheduled for the same weekend in City X. For each conference, the table lists the conference sponsor, the registration fee, the discounted registration fee (if any), the host hotel, the rate for rooms in the block at the host hotel, and the lowest rate for an available room in the host hotel during that same weekend. Conference attendees will require two nights lodging, and all room rates are per guest, per night, assuming two guests per room. The lowest rate for an available room in City X on this same weekend is $65.

Sponsor	Registration fee	Discounted registration fee	Host hotel	Block rate	Lowest rate in host hotel
AMG	$225	$150	Garden Inn	$120	$65
CC	$720	$620	Hilton	$110	$70
CDA	$450	$400	Asiawest Center	$190	$185
FFNA	$325	$275	Hilton	$140	$70
HMHPA	$600	$575	Holiday Inn	$104	$79
PPOA	$550	$400	Hilton	$105	$70
PNDA	$425	$400	Bard Inn	$125	$125
QRTA	$325	no discount	Asiawest Center	$195	$185
RCD	$995	$895	Asiawest Center	$195	$185
WWLOP	$475	no discount	Perry Pavilion	$155	$155

Question 1

For each of the following sponsors, select *Yes* if an attendee of the sponsor's conference would spend less money by employing the ROB strategy—paying the lowest possible room rate in the host hotel and paying the nondiscounted registration fee—than by reserving a room in the block. Otherwise, select *No*.

	Yes	No	
1A.	○	○	CC
1B.	○	○	FFNA
1C.	○	○	HMHPA

Question 2

Assume that host hotels receive a reimbursement from the conference organizers for 25% of the block rate per night for each unoccupied room in the conference block. For each of the following hotels, select *Yes* if, for at least one conference on the weekend listed, the hotel would lose room revenue if a room in the block is vacant because an attendee employed the ROB strategy. Otherwise, select *No*.

	Yes	No	
2A.	○	○	Asiawest Center
2B.	○	○	Bard Inn
2C.	○	○	Hilton

Question 3

3. Let X denote the block rate of the host hotel for a particular conference, and let Y denote the lowest room rate available in the host hotel outside of the conference block. For a conference that requires a two-night hotel stay, which one of the following expressions represents the least amount of discount on the conference registration fee that, according to the article, would be sufficient to deter conference attendees from employing the ROB strategy in choosing accommodations?

- A. $\frac{X+Y}{2}$
- B. $\frac{X-Y}{2}$
- C. $X-Y$
- D. $X+Y$
- E. $2(X-Y)$

Question 4

For each of the following sponsors, select *Yes* if an attendee of the sponsor's conference would spend less money by employing the ROHH strategy—paying the lowest possible room rate outside the host hotel and paying the nondiscounted registration fee—than by reserving a room in the block at the host hotel. Otherwise, select *No*.

	Yes	No	
4A.	○	○	CC
4B.	○	○	FFNA
4C.	○	○	PPOA

Question 5

Many individuals stand to benefit financially from attendees at conferences. For each of the following individuals, choose *Loss* if the individual would likely earn less money if rooms in the conference block are vacant because of attendees using ROHH strategies. Otherwise select *No loss*.

	Loss	No loss	
5A.	○	○	Speaker hired by a conference on education to speak about school reform
5B.	○	○	Room service waiter at the host hotel whose earnings are primarily from gratuities
5C.	○	○	Salaried front desk manager at the host hotel

Question 6

6. Assume that all host hotels for the conferences in City X on the weekend indicated have conference block rooms available and that all hotels in City X have rooms available at their lowest rates for the conference weekend. Which one of the following conferences is most likely to have attendees favoring the ROB strategy over the ROHH strategy?

- ○ A. AMG
- ○ B. CDA
- ○ C. QRTA
- ○ D. RCD
- ○ E. WWLOP

Data

Kenyan IPO pricing

Researchers recently examined the initial public offering (IPO)—a private firm's first sale of stock shares to the public—of firms listed on Kenya's Nairobi Stock Exchange (NSE) between 1994 and 2008. During this time, the number of IPOs listed per year varied from zero to four. The researchers wanted to examine the extent to which four different variables—investor sentiment, firm size, board prestige, and firm age—affected the IPO stock share price, which is set by the firm. They hypothesized that all four variables would show a strong positive correlation with this IPO asking price. However, after examining the firms listed, they were surprised to find that none of the variables showed a strong positive correlation with IPO pricing, and in fact investor sentiment and board prestige both showed a strong negative correlation.

The researchers also discovered that nearly all of these IPOs were underpriced by an average of 50 percent, which is to say the IPO share prices were about half of what the share prices were at the close of that first day of trading. Such underpricing constitutes a loss to the listed firm because the firm could have immediately raised more money with a higher price. The researchers noted that firms should take care to set an IPO price low enough to capture investor interest but high enough to generate sufficient capital for the firm.

Kenyan IPOs, 1994–2008

The table lists companies, examined by the researchers, that had their IPO on the NSE between 1994 and 2008, together with the IPO share price, first day closing price, and percent underpricing. Prices are in Kenyan shillings.

Company	IPO year	IPO share price (P_0)	First day closing price (P_1)	Percent underpricing*
Co-Operative Bank	2008	9.50	10.45	10.00
Safaricom	2008	5.00	7.35	47.00
Kenya Re	2007	9.50	16.00	68.42
Access Kenya	2007	10.00	13.45	34.50
Eveready	2006	9.50	11.00	15.79
Scangroup	2006	10.45	15.00	43.54
Kengen	2006	11.90	40.00	236.13
Mumias Sugar	2001	6.25	6.25	0.00
Athi River Mining	1997	12.25	12.60	2.86
Kenya Airways	1996	11.25	12.55	11.56
Rea Vipingo	1996	10.50	12.00	14.29
National Bank of Kenya	1994	10.00	26.00	160.00
Firestone East Africa	1994	35.50	35.00	−1.41

*The percent change from P_0 to P_1

Question 7

For each of the following statements, select *Inferable* if the statement is reasonably inferable from the information provided about the NSE IPOs. Otherwise select *Not inferable*.

	Inferable	Not inferable	
7A.	○	○	IPOs of firms with prestigious boards were more likely to be underpriced than those of other firms.
7B.	○	○	Firestone East Africa set its IPO price slightly lower than it should have.
7C.	○	○	At least one of the firms examined by the researchers did not have an underpriced IPO.

Question 8

For each of the following statements, select *Supported* if the statement is supported by the information provided about NSE IPOs. Otherwise select *Not supported*.

	Supported	Not supported	
8A.	○	○	The board of Safaricom was likely considered more prestigious than that of Co-Operative Bank at the time of their IPOs.
8B.	○	○	Kenya Re and Eveready were approximately the same size firms at the time of their IPOs.
8C.	○	○	When their IPO prices were set, investor sentiment was likely more favorable toward Kengen than toward Scangroup or Eveready.

Question 9

9. The discussion of the researchers' study of Kenyan IPOs refers to "board prestige" primarily to

- A. help explain why investor sentiment toward some firms is sometimes very low
- B. caution that some variables should not be considered accurate predictors of IPO pricing
- C. introduce one of the variables whose relationship to IPO pricing surprised the researchers
- D. point to one of the attributes firms often use to generate investor interest in their IPO
- E. demonstrate that some attributes of a firm are often negatively correlated with the firm's IPO price

Data

Sports Association

Statement by sports association spokesperson:

Our sports association issues contracts to television networks for the exclusive right to broadcast our sporting events. For this right, the networks pay the association substantial fees, which help finance our leagues. We also provide free media passes to our events for journalists so that they can effectively report on sports news, including final scores. Now, however, some news organizations are posting video clips, audio clips, digital photographs, and live score updates from our events on their websites. Conditions must be placed on these practices, which go beyond mere sports news reporting; they harm the value of our broadcasting contracts and violate our rights as the owners of the sports leagues. News organizations that wish to post such information on their websites should therefore sign contracts with the sports association that stipulate what postings will be allowed and how much they will cost. As we have in the past, we will deny media passes to journalists from news organizations that do not comply with our requirements.

News Organizations

Statement by news organizations spokesperson:

The news business has largely shifted from print media to the Internet, where readers expect text to be accompanied by audio and images. To charge news organizations for providing online sports coverage or to place unnecessary conditions on that coverage is to deny news organizations their right to cover the news. Online news sites are not asking to broadcast sporting events in their entirety, and their sports reporting does not detract from the value of the sports leagues or their events. On the contrary—free, engaging sports reporting generates interest in sports and thus benefits readers and the sports association alike. News organizations must be allowed to report freely about sports on their websites, in any time-frame, using any type of online medium they deem effective.

Question 10

For each of the following statements, select *Both accept* if, based on the information provided, it can be inferred that both the sports association and the news organizations would likely accept that the statement is true. If not, select *Otherwise*.

	Both accept	Otherwise	
10A.	○	○	There should be no restrictions on news organizations' sports reporting in broadcast media.
10B.	○	○	A sporting event can be adequately reported by a news organization without broadcasting the event in its entirety on the organization's website.
10C.	○	○	Any online activity that substantially increases many people's interest in the sports association's leagues benefits the association.

Question 11

For each of the following issues, select *Disagree* if, based on the information provided, it can be inferred that the sports association and the news organizations would hold opposing positions on the issue. Otherwise, select *Cannot infer disagreement*.

	Disagree	Cannot infer disagreement	
11A.	○	○	The degree to which online sports reporting generates interest in sports
11B.	○	○	How frequently a website should be able to update scores from a sporting event in progress
11C.	○	○	The conditions under which a news organization should be allowed access to report on the sports association's events

Question 12

12. Based on the statements, which one of the following can most reasonably be inferred to be a view held by the news organizations?

- A. Online news consumers have the right to reproduce digital photographs and audio and video clips of sports association events posted on news organizations' websites.
- B. News organizations' ability to cover sports news effectively will be hampered if their use of online audio, video, and images is prohibited.
- C. News organizations have the exclusive right to report on sports news online.
- D. People are less likely to attend sports events if they have access to live score updates online.
- E. The sports association should restrict how audio and video clips of its sports events can be disseminated.

Data

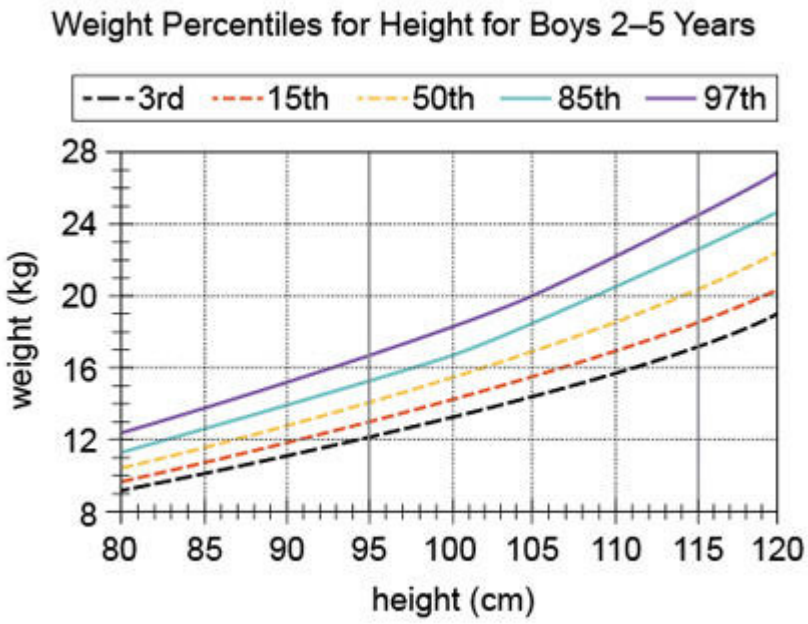
Height-for-age standards

The World Health Organization (WHO) has produced a comprehensive set of growth standards for children. These standards are based on studies of children living in 6 nations on 5 continents under optimal conditions with respect to health and nutrition. The table displays the percentile distribution of height, in centimeters, at 3-month intervals, for boys ages 2 through 5 according to the WHO model. In a *model population*—a large population of boys ages 2 through 5 that conforms to the WHO growth standards—for n = 3, 15, 50, 85, and 97, the nth percentile in height for a given age is the unique height among boys of that age that is greater than or equal to n percent, and less than or equal to (100 – n) percent, of heights of boys of that age.

Age (year: month)	Height in centimeters, by percentile				
	3rd	15th	50th	85th	97th
2:0	81.4	83.9	87.1	90.3	92.9
2:3	83.5	86.3	89.6	93.0	95.7
2:6	85.5	88.4	91.9	95.5	98.3
2:9	87.4	90.4	94.1	97.8	100.8
3:0	89.1	92.2	96.1	99.9	103.1
3:3	90.8	94.0	98.0	102.0	105.2
3:6	92.4	95.7	99.9	104.0	107.3
3:9	93.9	97.4	101.6	105.8	109.3
4:0	95.4	99.0	103.3	107.7	111.2
4:3	96.9	100.5	105.0	109.5	113.1
4:6	98.4	102.1	106.7	111.2	115.0
4:9	99.8	103.6	108.3	113.0	116.8
5:0	101.2	105.2	110.0	114.8	118.7

Weight-for-height standards

The graph shows the percentile distribution of weight, in kilograms, for heights from 80 cm to 120 cm, for boys ages 2 through 5, according to the WHO model. In a model population, for $n = 3$, 15, 50, 85, and 97, the nth percentile in weight for a given height is the unique weight among boys of that height that is greater than or equal to n percent, and less than or equal to $(100 - n)$ percent, of weights of boys of that height.



Question 13

B is a boy aged 4 years 3 months whose height is 110 cm and whose weight is 19 kg. For each of the following statements, select *Yes* if, based on the given information, it must be true of B relative to a model population. Otherwise, select *No*.

	Yes	No	
13A.	○	○	Approximately 50% of boys at the same weight are shorter than B.
13B.	○	○	No more than 15% of boys at this age are taller than B.
13C.	○	○	B's height is greater than or equal to that of 50% of boys aged 5 years 0 months.

Question 14

For each of the following statements, select *Yes* if the statement must be true of a boy selected at random from a model population. Otherwise, select *No*.

	Yes	No	
14A.	○	○	If his age is greater than 3 years 3 months, the probability that his height is at least 98.0 cm is greater than 50%.
14B.	○	○	If he is at least 105 cm tall, the probability that his weight is 14.0 kg is no greater than 3%.
14C.	○	○	If he is 114 cm tall, he is taller than at least 85% of boys his age.

Question 15

15. Consider an individual boy from a model population. Suppose that from age 2 through age 5, this boy's weight is at the 50th percentile for his height and his height is at the 50th percentile for his age. Which one of the following statements must be true of the boy at age 5 years 0 months?

- A. His age is at the 50th percentile for his height.
- B. His weight is at the 50th percentile for his age.
- C. His height is at the 50th percentile for his weight.
- D. His weight is approximately 150% of his weight at age 2 years 0 months.
- E. His weight is approximately 200% of his weight at age 2 years 0 months.

Question 16

B is a boy aged 4 years 3 months whose height is 110 cm and whose weight is 19 kg. For each of the following statements, select *Yes* if, based on the given information, it must be true of B relative to a model population. Otherwise, select *No*.

	Yes	No	
16A.	○	○	At least 15% of boys at the same height have a weight that is less than or equal to that of B.
16B.	○	○	At least 80% of boys at this age have heights within 10% of B's height.
16C.	○	○	B's height is less than that of at most 3% of boys at age 4 years 0 months.

Question 17

For each of the following statements, select *Yes* if the statement must be true of a boy selected at random from a model population. Otherwise, select *No*.

	Yes	No	
17A.	○	○	If his age is exactly 4 years 0 months, the probability that his height is at exactly 99.0 cm is 15%.
17B.	○	○	If he is 81 cm tall, he is shorter than at least 95% of boys his age.
17C.	○	○	If he is 120 cm tall, he weighs more than 97% of boys age 2 years 6 months.

Question 18

18. Consider an individual boy from a model population. Suppose that from age 2 through age 5, this boy's weight is at the 97th percentile for his height and his height is at the 97th percentile for his age. Which one of the following statements must be true of the boy at age 5 years 0 months?

- ○ A. His age is at the 97th percentile for his height.
- ○ B. His weight is at the 97th percentile for his age.
- ○ C. His height is at the 97th percentile for his weight.
- ○ D. His weight is approximately 166% of his weight at age 2 years 0 months.
- ○ E. His weight is approximately 197% of his weight at age 2 years 0 months.

Data

The table lists minimum temperature, maximum temperature, and weather conditions reported in 30 cities on 6 continents on February 19, 2011.

Sort By: City

City	Continent	Minimum temperature (°C)	Maximum temperature (°C)	Weather conditions
Atlanta	North America	11	21	cloudy
Auckland	Oceania	18	25	cloudy
Bangkok	Asia	26	34	cloudy
Beijing	Asia	–3	10	fine
Berlin	Europe	–4	–1	cloudy
Buenos Aires	South America	20	29	rain
Cairo	Africa	14	24	fine
Chicago	North America	–4	3	cloudy
Dublin	Europe	5	11	bright
Frankfurt	Europe	1	7	cloudy
Houston	North America	16	24	cloudy
Johannesburg	Africa	16	26	thunderstorms
Kuala Lumpur	Asia	24	33	rain
London	Europe	5	10	rain
Los Angeles	North America	10	15	showers
Madrid	Europe	5	12	rain
Manila	Asia	22	32	thunderstorms
Mexico City	North America	7	25	fine
Montréal	North America	–6	–4	bright
Mumbai	Asia	21	30	fine
New York	North America	2	3	snow
Paris	Europe	5	7	rain
Rio de Janeiro	South America	21	38	cloudy
Santiago	South America	11	29	fine
Seoul	Asia	–3	9	cloudy
Sydney	Oceania	25	29	showers
Tehran	Asia	3	11	haze
Tokyo	Asia	3	9	fine
Toronto	North America	–6	–2	cloudy
Vancouver	North America	–2	5	fine

Sort By: Continent

City	Continent	Minimum temperature (°C)	Maximum temperature (°C)	Weather conditions
Cairo	Africa	14	24	fine
Johannesburg	Africa	16	26	thunderstorms
Bangkok	Asia	26	34	cloudy
Beijing	Asia	–3	10	fine
Kuala Lumpur	Asia	24	33	rain
Manila	Asia	22	32	thunderstorms
Mumbai	Asia	21	30	fine
Seoul	Asia	–3	9	cloudy
Tehran	Asia	3	11	haze
Tokyo	Asia	3	9	fine
Berlin	Europe	–4	–1	cloudy
Dublin	Europe	5	11	bright
Frankfurt	Europe	1	7	cloudy
London	Europe	5	10	rain
Madrid	Europe	5	12	rain
Paris	Europe	5	7	rain
Atlanta	North America	11	21	cloudy
Chicago	North America	–4	3	cloudy
Houston	North America	16	24	cloudy
Los Angeles	North America	10	15	showers
Mexico City	North America	7	25	fine
Montréal	North America	–6	–4	bright
New York	North America	2	3	snow
Toronto	North America	–6	–2	cloudy
Vancouver	North America	–2	5	fine
Auckland	Oceania	18	25	cloudy
Sydney	Oceania	25	29	showers
Buenos Aires	South America	20	29	rain
Rio de Janeiro	South America	21	38	cloudy
Santiago	South America	11	29	fine

Sort By: Minimum temperature (°C)

City	Continent	Minimum temperature (°C)	Maximum temperature (°C)	Weather conditions
Montréal	North America	−6	−4	bright
Toronto	North America	−6	−2	cloudy
Berlin	Europe	−4	−1	cloudy
Chicago	North America	−4	3	cloudy
Beijing	Asia	−3	10	fine
Seoul	Asia	−3	9	cloudy
Vancouver	North America	−2	5	fine
Frankfurt	Europe	1	7	cloudy
New York	North America	2	3	snow
Tehran	Asia	3	11	haze
Tokyo	Asia	3	9	fine
Dublin	Europe	5	11	bright
London	Europe	5	10	rain
Madrid	Europe	5	12	rain
Paris	Europe	5	7	rain
Mexico City	North America	7	25	fine
Los Angeles	North America	10	15	showers
Atlanta	North America	11	21	cloudy
Santiago	South America	11	29	fine
Cairo	Africa	14	24	fine
Houston	North America	16	24	cloudy
Johannesburg	Africa	16	26	thunderstorms
Auckland	Oceania	18	25	cloudy
Buenos Aires	South America	20	29	rain
Mumbai	Asia	21	30	fine
Rio de Janeiro	South America	21	38	cloudy
Manila	Asia	22	32	thunderstorms
Kuala Lumpur	Asia	24	33	rain
Sydney	Oceania	25	29	showers
Bangkok	Asia	26	34	cloudy

Sort By: Maximum temperature (°C)

City	Continent	Minimum temperature (°C)	Maximum temperature (°C)	Weather conditions
Montréal	North America	−6	−4	bright
Toronto	North America	−6	−2	cloudy
Berlin	Europe	−4	−1	cloudy
Chicago	North America	−4	3	cloudy
New York	North America	2	3	snow
Vancouver	North America	−2	5	fine
Frankfurt	Europe	1	7	cloudy
Paris	Europe	5	7	rain
Seoul	Asia	−3	9	cloudy
Tokyo	Asia	3	9	fine
Beijing	Asia	−3	10	fine
London	Europe	5	10	rain
Dublin	Europe	5	11	bright
Tehran	Asia	3	11	haze
Madrid	Europe	5	12	rain
Los Angeles	North America	10	15	showers
Atlanta	North America	11	21	cloudy
Cairo	Africa	14	24	fine
Houston	North America	16	24	cloudy
Auckland	Oceania	18	25	cloudy
Mexico City	North America	7	25	fine
Johannesburg	Africa	16	26	thunderstorms
Buenos Aires	South America	20	29	rain
Santiago	South America	11	29	fine
Sydney	Oceania	25	29	showers
Mumbai	Asia	21	30	fine
Manila	Asia	22	32	thunderstorms
Kuala Lumpur	Asia	24	33	rain
Bangkok	Asia	26	34	cloudy
Rio de Janeiro	South America	21	38	cloudy

Sort By: Weather conditions

City	Continent	Minimum temperature (°C)	Maximum temperature (°C)	Weather conditions
Dublin	Europe	5	11	bright
Montréal	North America	−6	−4	bright
Atlanta	North America	11	21	cloudy
Auckland	Oceania	18	25	cloudy
Bangkok	Asia	26	34	cloudy
Berlin	Europe	−4	−1	cloudy
Chicago	North America	−4	3	cloudy
Frankfurt	Europe	1	7	cloudy
Houston	North America	16	24	cloudy
Rio de Janeiro	South America	21	38	cloudy
Seoul	Asia	−3	9	cloudy
Toronto	North America	−6	−2	cloudy
Beijing	Asia	−3	10	fine
Cairo	Africa	14	24	fine
Mexico City	North America	7	25	fine
Mumbai	Asia	21	30	fine
Santiago	South America	11	29	fine
Tokyo	Asia	3	9	fine
Vancouver	North America	−2	5	fine
Tehran	Asia	3	11	haze
Buenos Aires	South America	20	29	rain
Kuala Lumpur	Asia	24	33	rain
London	Europe	5	10	rain
Madrid	Europe	5	12	rain
Paris	Europe	5	7	rain
Los Angeles	North America	10	15	showers
Sydney	Oceania	25	29	showers
New York	North America	2	3	snow
Johannesburg	Africa	16	26	thunderstorms
Manila	Asia	22	32	thunderstorms

Question 19

For each of the following statements, select *Yes* if the statement is true based solely on the information reported for these cities on this day. Otherwise select *No*.

	Yes	No	
19A.	○	○	The mean maximum temperature for the cities in South America was greater than that for the cities in Oceania.
19B.	○	○	At least one city reporting *fine* weather had a maximum temperature less than 0°C.
19C.	○	○	For the Asian cities, the median minimum temperature was 12°C.

Data

During a recent semester at University X, 25 students enrolled in an economics class. Each student was enrolled in the university's 4-year business program and took the course either as a traditional student (attending class and sitting for exams in person) or as an online student (listening to lectures and taking exams via computer), but not both. For each student, the table indicates whether he or she took the course online, along with his or her year in the program and scores on Exam 1, Exam 2, and the final exam. The final score was computed as a weighted mean of the scores on Exam 1, Exam 2, and the final exam, using the same weights for each student.

Sort By: Student surname

Student surname	Online student? (Y/N)	Year in program	Exam 1 score	Exam 2 score	Final exam score	Final score
Abusuba	Y	2	89	87	85	86.50
Ardanin	N	1	85	83	84	84.00
Bar-Yaacov	Y	1	65	70	68	67.75
Benson	Y	1	77	80	75	76.75
Dedeoglu	N	2	90	96	95	94.00
Derezinski	Y	3	85	84	82	83.25
Garcia	Y	2	90	87	86	87.25
Hernandez	N	2	72	74	75	74.00
Jeyaretnam	Y	2	77	76	78	77.25
Lindt	Y	3	87	82	81	82.75
Mladek	N	4	64	75	76	72.75
Nguyen	N	3	70	74	72	72.00
Orlando	N	2	82	84	80	81.50
Pai	N	2	75	78	72	74.25
Parasarathy	N	2	88	91	95	92.25
Radzinsky	Y	3	91	95	100	96.50
Russell	N	4	51	69	72	66.00
Sweets	N	2	66	76	74	72.50
Sykes	N	3	51	69	73	66.50
Tachau	N	2	91	93	92	92.00
Tsosie	N	2	84	87	85	85.25
Underhill	N	1	77	75	71	73.50
Vladimirov	Y	3	69	75	74	73.00
Washburn	N	2	85	83	82	83.00
Zervos	N	2	95	97	98	97.00

Sort By: Online student? (Y/N)

Student surname	Online student? (Y/N)	Year in program	Exam 1 score	Exam 2 score	Final exam score	Final score
Abusuba	Y	2	89	87	85	86.50
Bar-Yaacov	Y	1	65	70	68	67.75
Benson	Y	1	77	80	75	76.75
Derezinski	Y	3	85	84	82	83.25
Garcia	Y	2	90	87	86	87.25
Jeyaretnam	Y	2	77	76	78	77.25
Lindt	Y	3	87	82	81	82.75
Radzinsky	Y	3	91	95	100	96.50
Vladimirov	Y	3	69	75	74	73.00
Ardanin	N	1	85	83	84	84.00
Dedeoglu	N	2	90	96	95	94.00
Hernandez	N	2	72	74	75	74.00
Mladek	N	4	64	75	76	72.75
Nguyen	N	3	70	74	72	72.00
Orlando	N	2	82	84	80	81.50
Pai	N	2	75	78	72	74.25
Parasarathy	N	2	88	91	95	92.25
Russell	N	4	51	69	72	66.00
Sweets	N	2	66	76	74	72.50
Sykes	N	3	51	69	73	66.50
Tachau	N	2	91	93	92	92.00
Tsosie	N	2	84	87	85	85.25
Underhill	N	1	77	75	71	73.50
Washburn	N	2	85	83	82	83.00
Zervos	N	2	95	97	98	97.00

Sort By: Year in program

Student surname	Online student? (Y/N)	Year in program	Exam 1 score	Exam 2 score	Final exam score	Final score
Ardanin	N	1	85	83	84	84.00
Bar-Yaacov	Y	1	65	70	68	67.75
Benson	Y	1	77	80	75	76.75
Underhill	N	1	77	75	71	73.50
Abusuba	Y	2	89	87	85	86.50
Dedeoglu	N	2	90	96	95	94.00
Garcia	Y	2	90	87	86	87.25
Hernandez	N	2	72	74	75	74.00
Jeyaretnam	Y	2	77	76	78	77.25
Orlando	N	2	82	84	80	81.50
Pai	N	2	75	78	72	74.25
Parasarathy	N	2	88	91	95	92.25
Sweets	N	2	66	76	74	72.50
Tachau	N	2	91	93	92	92.00
Tsosie	N	2	84	87	85	85.25
Washburn	N	2	85	83	82	83.00
Zervos	N	2	95	97	98	97.00
Derezinski	Y	3	85	84	82	83.25
Lindt	Y	3	87	82	81	82.75
Nguyen	N	3	70	74	72	72.00
Radzinsky	Y	3	91	95	100	96.50
Sykes	N	3	51	69	73	66.50
Vladimirov	Y	3	69	75	74	73.00
Mladek	N	4	64	75	76	72.75
Russell	N	4	51	69	72	66.00

Sort By: Exam 1 score

Student surname	Online student? (Y/N)	Year in program	Exam 1 score	Exam 2 score	Final exam score	Final score
Russell	N	4	51	69	72	66.00
Sykes	N	3	51	69	73	66.50
Mladek	N	4	64	75	76	72.75
Bar-Yaacov	Y	1	65	70	68	67.75
Sweets	N	2	66	76	74	72.50
Vladimirov	Y	3	69	75	74	73.00
Nguyen	N	3	70	74	72	72.00
Hernandez	N	2	72	74	75	74.00
Pai	N	2	75	78	72	74.25
Benson	Y	1	77	80	75	76.75
Jeyaretnam	Y	2	77	76	78	77.25
Underhill	N	1	77	75	71	73.50
Orlando	N	2	82	84	80	81.50
Tsosie	N	2	84	87	85	85.25
Ardanin	N	1	85	83	84	84.00
Derezinski	Y	3	85	84	82	83.25
Washburn	N	2	85	83	82	83.00
Lindt	Y	3	87	82	81	82.75
Parasarathy	N	2	88	91	95	92.25
Abusuba	Y	2	89	87	85	86.50
Dedeoglu	N	2	90	96	95	94.00
Garcia	Y	2	90	87	86	87.25
Radzinsky	Y	3	91	95	100	96.50
Tachau	N	2	91	93	92	92.00
Zervos	N	2	95	97	98	97.00

Sort By: Exam 2 score

Student surname	Online student? (Y/N)	Year in program	Exam 1 score	Exam 2 score	Final exam score	Final score
Russell	N	4	51	69	72	66.00
Sykes	N	3	51	69	73	66.50
Bar-Yaacov	Y	1	65	70	68	67.75
Hernandez	N	2	72	74	75	74.00
Nguyen	N	3	70	74	72	72.00
Mladek	N	4	64	75	76	72.75
Underhill	N	1	77	75	71	73.50
Vladimirov	Y	3	69	75	74	73.00
Jeyaretnam	Y	2	77	76	78	77.25
Sweets	N	2	66	76	74	72.50
Pai	N	2	75	78	72	74.25
Benson	Y	1	77	80	75	76.75
Lindt	Y	3	87	82	81	82.75
Ardanin	N	1	85	83	84	84.00
Washburn	N	2	85	83	82	83.00
Derezinski	Y	3	85	84	82	83.25
Orlando	N	2	82	84	80	81.50
Abusuba	Y	2	89	87	85	86.50
Garcia	Y	2	90	87	86	87.25
Tsosie	N	2	84	87	85	85.25
Parasarathy	N	2	88	91	95	92.25
Tachau	N	2	91	93	92	92.00
Radzinsky	Y	3	91	95	100	96.50
Dedeoglu	N	2	90	96	95	94.00
Zervos	N	2	95	97	98	97.00

Sort By: Final exam score

Student surname	Online student? (Y/N)	Year in program	Exam 1 score	Exam 2 score	Final exam score	Final score
Bar-Yaacov	Y	1	65	70	68	67.75
Underhill	N	1	77	75	71	73.50
Nguyen	N	3	70	74	72	72.00
Pai	N	2	75	78	72	74.25
Russell	N	4	51	69	72	66.00
Sykes	N	3	51	69	73	66.50
Sweets	N	2	66	76	74	72.50
Vladimirov	Y	3	69	75	74	73.00
Benson	Y	1	77	80	75	76.75
Hernandez	N	2	72	74	75	74.00
Mladek	N	4	64	75	76	72.75
Jeyaretnam	Y	2	77	76	78	77.25
Orlando	N	2	82	84	80	81.50
Lindt	Y	3	87	82	81	82.75
Derezinski	Y	3	85	84	82	83.25
Washburn	N	2	85	83	82	83.00
Ardanin	N	1	85	83	84	84.00
Abusuba	Y	2	89	87	85	86.50
Tsosie	N	2	84	87	85	85.25
Garcia	Y	2	90	87	86	87.25
Tachau	N	2	91	93	92	92.00
Dedeoglu	N	2	90	96	95	94.00
Parasarathy	N	2	88	91	95	92.25
Zervos	N	2	95	97	98	97.00
Radzinsky	Y	3	91	95	100	96.50

Sort By: Final score

Student surname	Online student? (Y/N)	Year in program	Exam 1 score	Exam 2 score	Final exam score	Final score
Russell	N	4	51	69	72	66.00
Sykes	N	3	51	69	73	66.50
Bar-Yaacov	Y	1	65	70	68	67.75
Nguyen	N	3	70	74	72	72.00
Sweets	N	2	66	76	74	72.50
Mladek	N	4	64	75	76	72.75
Vladimirov	Y	3	69	75	74	73.00
Underhill	N	1	77	75	71	73.50
Hernandez	N	2	72	74	75	74.00
Pai	N	2	75	78	72	74.25
Benson	Y	1	77	80	75	76.75
Jeyaretnam	Y	2	77	76	78	77.25
Orlando	N	2	82	84	80	81.50
Lindt	Y	3	87	82	81	82.75
Washburn	N	2	85	83	82	83.00
Derezinski	Y	3	85	84	82	83.25
Ardanin	N	1	85	83	84	84.00
Tsosie	N	2	84	87	85	85.25
Abusuba	Y	2	89	87	85	86.50
Garcia	Y	2	90	87	86	87.25
Tachau	N	2	91	93	92	92.00
Parasarathy	N	2	88	91	95	92.25
Dedeoglu	N	2	90	96	95	94.00
Radzinsky	Y	3	91	95	100	96.50
Zervos	N	2	95	97	98	97.00

Question 20

For each of the following statements, select *Yes* if the statement is true based on the information provided; otherwise select *No*.

	Yes	No	
20A.	○	○	The score on the final exam had equal weight with the score on Exam 2 in computing the final score.
20B.	○	○	The median final score for all 25 students was 81.50.
20C.	○	○	For Exam 1 scores for students in year 3 of the program, the range was 40.

Data

Anthropologists collected data about cultural patterns and norms for several small indigenous populations in various countries. The table displays data collected about the economic base; residential patterns (residence); degree of market integration (mean MI)—defined as the percentage of calories obtained in the marketplace; percentage of population participating in world religions (mean WR); and average community size (mean CS).

Sort By: Population

Population	Location	Economic base	Residence	Mean MI	Mean WR	Mean CS
Au	Papua New Guinea	horticulture, foraging	sedentary	1	100	309
Dolgan/NG	Siberia	hunting, fishing, and wage work	semisedentary	63	59	612
Gusii	Kenya	farming and wage work	sedentary	28	100	4,063
Hadza	Tanzania	foraging	nomadic	0	0	43
Isanga Village	Tanzania	farming and wage work	sedentary	70	99	1,500
Maragoli	Kenya	farming and wage work	sedentary	43	100	3,843
Orma	Kenya	herding livestock	seminomadic	72	100	125
Samburu	Kenya	herding livestock	seminomadic	69	66	2,000
Sanquianga	Colombia	fisheries	sedentary	82	84	1,931
Shuar	Ecuador	horticulture	sedentary	22	76	498
Sursurunga	Papua New Guinea	horticulture	sedentary	24	100	186
Tsimane	Bolivia	horticulture, foraging	seminomadic	7	100	314
Yasawa	Fiji	horticulture, marine foraging	sedentary	21	100	109

Sort By: Location

Population	Location	Economic base	Residence	Mean MI	Mean WR	Mean CS
Tsimane	Bolivia	horticulture, foraging	seminomadic	7	100	314
Sanquianga	Colombia	fisheries	sedentary	82	84	1,931
Shuar	Ecuador	horticulture	sedentary	22	76	498
Yasawa	Fiji	horticulture, marine foraging	sedentary	21	100	109
Gusii	Kenya	farming and wage work	sedentary	28	100	4,063
Maragoli	Kenya	farming and wage work	sedentary	43	100	3,843
Orma	Kenya	herding livestock	seminomadic	72	100	125
Samburu	Kenya	herding livestock	seminomadic	69	66	2,000
Au	Papua New Guinea	horticulture, foraging	sedentary	1	100	309
Sursurunga	Papua New Guinea	horticulture	sedentary	24	100	186
Dolgan/NG	Siberia	hunting, fishing, and wage work	semisedentary	63	59	612
Hadza	Tanzania	foraging	nomadic	0	0	43
Isanga Village	Tanzania	farming and wage work	sedentary	70	99	1,500

Sort By: Economic base

Population	Location	Economic base	Residence	Mean MI	Mean WR	Mean CS
Gusii	Kenya	farming and wage work	sedentary	28	100	4,063
Isanga Village	Tanzania	farming and wage work	sedentary	70	99	1,500
Maragoli	Kenya	farming and wage work	sedentary	43	100	3,843
Sanquianga	Colombia	fisheries	sedentary	82	84	1,931
Hadza	Tanzania	foraging	nomadic	0	0	43
Orma	Kenya	herding livestock	seminomadic	72	100	125
Samburu	Kenya	herding livestock	seminomadic	69	66	2,000
Shuar	Ecuador	horticulture	sedentary	22	76	498
Sursurunga	Papua New Guinea	horticulture	sedentary	24	100	186
Au	Papua New Guinea	horticulture, foraging	sedentary	1	100	309
Tsimane	Bolivia	horticulture, foraging	seminomadic	7	100	314
Yasawa	Fiji	horticulture, marine foraging	sedentary	21	100	109
Dolgan/NG	Siberia	hunting, fishing, and wage work	semisedentary	63	59	612

Sort By: Residence

Population	Location	Economic base	Residence	Mean MI	Mean WR	Mean CS
Hadza	Tanzania	foraging	nomadic	0	0	43
Au	Papua New Guinea	horticulture, foraging	sedentary	1	100	309
Gusii	Kenya	farming and wage work	sedentary	28	100	4,063
Isanga Village	Tanzania	farming and wage work	sedentary	70	99	1,500
Maragoli	Kenya	farming and wage work	sedentary	43	100	3,843
Sanquianga	Colombia	fisheries	sedentary	82	84	1,931
Shuar	Ecuador	horticulture	sedentary	22	76	498
Sursurunga	Papua New Guinea	horticulture	sedentary	24	100	186
Yasawa	Fiji	horticulture, marine foraging	sedentary	21	100	109
Orma	Kenya	herding livestock	seminomadic	72	100	125
Samburu	Kenya	herding livestock	seminomadic	69	66	2,000
Tsimane	Bolivia	horticulture, foraging	seminomadic	7	100	314
Dolgan/NG	Siberia	hunting, fishing, and wage work	semisedentary	63	59	612

Sort By: Mean MI

Population	Location	Economic base	Residence	Mean MI	Mean WR	Mean CS
Hadza	Tanzania	foraging	nomadic	0	0	43
Au	Papua New Guinea	horticulture, foraging	sedentary	1	100	309
Tsimane	Bolivia	horticulture, foraging	seminomadic	7	100	314
Yasawa	Fiji	horticulture, marine foraging	sedentary	21	100	109
Shuar	Ecuador	horticulture	sedentary	22	76	498
Sursurunga	Papua New Guinea	horticulture	sedentary	24	100	186
Gusii	Kenya	farming and wage work	sedentary	28	100	4,063
Maragoli	Kenya	farming and wage work	sedentary	43	100	3,843
Dolgan/NG	Siberia	hunting, fishing, and wage work	semisedentary	63	59	612
Samburu	Kenya	herding livestock	seminomadic	69	66	2,000
Isanga Village	Tanzania	farming and wage work	sedentary	70	99	1,500
Orma	Kenya	herding livestock	seminomadic	72	100	125
Sanquianga	Colombia	fisheries	sedentary	82	84	1,931

Sort By: Mean WR

Population	Location	Economic base	Residence	Mean MI	Mean WR	Mean CS
Hadza	Tanzania	foraging	nomadic	0	0	43
Dolgan/NG	Siberia	hunting, fishing, and wage work	semisedentary	63	59	612
Samburu	Kenya	herding livestock	seminomadic	69	66	2,000
Shuar	Ecuador	horticulture	sedentary	22	76	498
Sanquianga	Colombia	fisheries	sedentary	82	84	1,931
Isanga Village	Tanzania	farming and wage work	sedentary	70	99	1,500
Au	Papua New Guinea	horticulture, foraging	sedentary	1	100	309
Gusii	Kenya	farming and wage work	sedentary	28	100	4,063
Maragoli	Kenya	farming and wage work	sedentary	43	100	3,843
Orma	Kenya	herding livestock	seminomadic	72	100	125
Sursurunga	Papua New Guinea	horticulture	sedentary	24	100	186
Tsimane	Bolivia	horticulture, foraging	seminomadic	7	100	314
Yasawa	Fiji	horticulture, marine foraging	sedentary	21	100	109

Sort By: Mean CS

Population	Location	Economic base	Residence	Mean MI	Mean WR	Mean CS
Hadza	Tanzania	foraging	nomadic	0	0	43
Yasawa	Fiji	horticulture, marine foraging	sedentary	21	100	109
Orma	Kenya	herding livestock	seminomadic	72	100	125
Sursurunga	Papua New Guinea	horticulture	sedentary	24	100	186
Au	Papua New Guinea	horticulture, foraging	sedentary	1	100	309
Tsimane	Bolivia	horticulture, foraging	seminomadic	7	100	314
Shuar	Ecuador	horticulture	sedentary	22	76	498
Dolgan/NG	Siberia	hunting, fishing, and wage work	semisedentary	63	59	612
Isanga Village	Tanzania	farming and wage work	sedentary	70	99	1,500
Sanquianga	Colombia	fisheries	sedentary	82	84	1,931
Samburu	Kenya	herding livestock	seminomadic	69	66	2,000
Maragoli	Kenya	farming and wage work	sedentary	43	100	3,843
Gusii	Kenya	farming and wage work	sedentary	28	100	4,063

Question 21

For each of the following statements about these indigenous populations, select *Yes* if the statement accurately reflects the data provided in the table. Otherwise, select *No*.

	Yes	No	
21A.	○	○	The populations that forage have the lowest market integration ratings.
21B.	○	○	Each of the populations that depend on both farming and wage work is sedentary and has a mean community size among the five largest.
21C.	○	○	The range for market integration is less than the range for participation in world religions.

Data

The table displays nutrition data per 240 mL serving for selected cooked or uncooked vegetables: percent water, energy in kilocalories (kcal), protein, total fat, carbohydrate, and total fiber, in grams (g). Each serving consists of 240 mL of finely chopped, raw vegetables (uncooked) or 240 mL of thoroughly drained, steamed vegetables (cooked).

Sort By: Vegetable

Vegetable	Cooked (yes/no)	Percent water	Energy (kcal)	Protein (g)	Total fat (g)	Carbohydrate (g)	Total fiber (g)
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
Broccoli	no	91	25	3	trace	5	2.6
Carrots	yes	87	70	2	trace	16	5.1
Carrots	no	88	47	1	trace	11	3.3
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
Spinach	no	92	7	1	trace	1	0.8
Summer squash	yes	94	36	2	1	8	2.5
Summer squash	no	94	23	1	trace	5	2.1
Sweet green pepper	no	92	40	1	trace	10	2.7

Sort By: Cooked (yes/no)

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	trace	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

Sort By: Percent water

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

Sort By: Energy (kcal)

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
Summer squash	yes	94	36	2	1	8	2.5
Sweet green pepper	no	92	40	1	trace	10	2.7
Spinach	yes	91	41	5	trace	7	4.3
Asparagus	yes	92	43	5	1	8	2.9
Broccoli	yes	91	44	5	1	8	4.5
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

Sort By: Protein (g)

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

Sort By: Total fat (g)

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

Sort By: Carbohydrate (g)

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
Mustard greens	yes	94	21	3	trace	3	2.8
Pak choi	yes	96	20	3	trace	3	2.7
Broccoli	no	91	25	3	trace	5	2.6
Summer squash	no	94	23	1	trace	5	2.1
Spinach	yes	91	41	5	trace	7	4.3
Asparagus	yes	92	43	5	1	8	2.9
Broccoli	yes	91	44	5	1	8	4.5
Summer squash	yes	94	36	2	1	8	2.5
Green beans	yes	89	44	2	trace	10	4.0
Sweet green pepper	no	92	40	1	trace	10	2.7
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

Sort By: Total fiber (g)

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

Question 22

For each of the following statements, select *Yes* if the statement is true based on the information provided; otherwise select *No*.

	Yes	No	
22A.	○	○	The median amount of protein for all uncooked vegetables listed is $\frac{1}{3}$ the median amount of protein for all cooked vegetables listed.
22B.	○	○	The amount of carbohydrate per serving of cooked corn is exactly 3 times the median amount of carbohydrate per serving for the other 14 vegetable options listed.
22C.	○	○	Each serving listed for which total fiber is less than 3.0 g also has at most 10 g of carbohydrate.

Data

The table shows the top 15 universities in a recent international ranking of programs in physics and astronomy. Each university was assigned a score on a 100-point scale in each of several categories, from which a total score on a 100-point scale was computed. For each university the table displays the total score, together with the scores in 3 categories: *academic*, based on evaluation by academics at other universities; *employer*, based on evaluation by companies that recruit university graduates; and *citations*, based on the frequency with which faculty research is cited.

Sort By: Rank

Rank	University	Country	Academic score	Employer score	Citations score	Total score
1	University of Cambridge	United Kingdom	100.0	100.0	41.3	82.4
2	Harvard University	United States	91.6	78.0	53.8	77.5
3	University of Oxford	United Kingdom	91.6	75.7	39.9	72.9
4	Massachusetts Institute of Technology (MIT)	United States	97.4	61.2	39.5	72.8
5	University of California, Berkley (UCB)	United States	90.8	48.5	45.2	68.7
6	Stanford University	United States	81.7	38.4	53.0	64.4
7	California Institute of Technology (Caltech)	United States	81.5	40.7	39.2	60.7
8	Imperial College London	United Kingdom	70.2	63.8	33.2	57.8
9	Princeton University	United States	76.4	30.3	44.1	57.5
10	ETH Zürich (Swiss Federal Institute of Technology)	Switzerland	69.6	42.2	46.9	57.3
11	University of Tokyo	Japan	79.7	34.6	22.7	53.6
12	University of Chicago	United States	57.1	34.4	53.3	51.4
13	University of California, Los Angeles (UCLA)	United States	55.9	51.3	43.0	51.1
14	University of Melbourne	Australia	46.6	41.5	64.4	50.9
15	Columbia University	United States	46.2	44.0	61.9	50.5

Sort By: University

Rank	University	Country	Academic score	Employer score	Citations score	Total score
7	California Institute of Technology (Caltech)	United States	81.5	40.7	39.2	60.7
15	Columbia University	United States	46.2	44.0	61.9	50.5
10	ETH Zürich (Swiss Federal Institute of Technology)	Switzerland	69.6	42.2	46.9	57.3
2	Harvard University	United States	91.6	78.0	53.8	77.5
8	Imperial College London	United Kingdom	70.2	63.8	33.2	57.8
4	Massachusetts Institute of Technology (MIT)	United States	97.4	61.2	39.5	72.8
9	Princeton University	United States	76.4	30.3	44.1	57.5
6	Stanford University	United States	81.7	38.4	53.0	64.4
5	University of California, Berkley (UCB)	United States	90.8	48.5	45.2	68.7
13	University of California, Los Angeles (UCLA)	United States	55.9	51.3	43.0	51.1
1	University of Cambridge	United Kingdom	100.0	100.0	41.3	82.4
12	University of Chicago	United States	57.1	34.4	53.3	51.4
14	University of Melbourne	Australia	46.6	41.5	64.4	50.9
3	University of Oxford	United Kingdom	91.6	75.7	39.9	72.9
11	University of Tokyo	Japan	79.7	34.6	22.7	53.6

Sort By: Country

Rank	University	Country	Academic score	Employer score	Citations score	Total score
14	University of Melbourne	Australia	46.6	41.5	64.4	50.9
11	University of Tokyo	Japan	79.7	34.6	22.7	53.6
10	ETH Zürich (Swiss Federal Institute of Technology)	Switzerland	69.6	42.2	46.9	57.3
1	University of Cambridge	United Kingdom	100.0	100.0	41.3	82.4
3	University of Oxford	United Kingdom	91.6	75.7	39.9	72.9
8	Imperial College London	United Kingdom	70.2	63.8	33.2	57.8
2	Harvard University	United States	91.6	78.0	53.8	77.5
4	Massachusetts Institute of Technology (MIT)	United States	97.4	61.2	39.5	72.8
5	University of California, Berkley (UCB)	United States	90.8	48.5	45.2	68.7
6	Stanford University	United States	81.7	38.4	53.0	64.4
7	California Institute of Technology (Caltech)	United States	81.5	40.7	39.2	60.7
9	Princeton University	United States	76.4	30.3	44.1	57.5
12	University of Chicago	United States	57.1	34.4	53.3	51.4
13	University of California, Los Angeles (UCLA)	United States	55.9	51.3	43.0	51.1
15	Columbia University	United States	46.2	44.0	61.9	50.5

Sort By: Academic score

Rank	University	Country	Academic score	Employer score	Citations score	Total score
15	Columbia University	United States	46.2	44.0	61.9	50.5
14	University of Melbourne	Australia	46.6	41.5	64.4	50.9
13	University of California, Los Angeles (UCLA)	United States	55.9	51.3	43.0	51.1
12	University of Chicago	United States	57.1	34.4	53.3	51.4
10	ETH Zürich (Swiss Federal Institute of Technology)	Switzerland	69.6	42.2	46.9	57.3
8	Imperial College London	United Kingdom	70.2	63.8	33.2	57.8
9	Princeton University	United States	76.4	30.3	44.1	57.5
11	University of Tokyo	Japan	79.7	34.6	22.7	53.6
7	California Institute of Technology (Caltech)	United States	81.5	40.7	39.2	60.7
6	Stanford University	United States	81.7	38.4	53.0	64.4
5	University of California, Berkley (UCB)	United States	90.8	48.5	45.2	68.7
2	Harvard University	United States	91.6	78.0	53.8	77.5
3	University of Oxford	United Kingdom	91.6	75.7	39.9	72.9
4	Massachusetts Institute of Technology (MIT)	United States	97.4	61.2	39.5	72.8
1	University of Cambridge	United Kingdom	100.0	100.0	41.3	82.4

Sort By: Employer score

Rank	University	Country	Academic score	Employer score	Citations score	Total score
9	Princeton University	United States	76.4	30.3	44.1	57.5
12	University of Chicago	United States	57.1	34.4	53.3	51.4
11	University of Tokyo	Japan	79.7	34.6	22.7	53.6
6	Stanford University	United States	81.7	38.4	53.0	64.4
7	California Institute of Technology (Caltech)	United States	81.5	40.7	39.2	60.7
14	University of Melbourne	Australia	46.6	41.5	64.4	50.9
10	ETH Zürich (Swiss Federal Institute of Technology)	Switzerland	69.6	42.2	46.9	57.3
15	Columbia University	United States	46.2	44.0	61.9	50.5
5	University of California, Berkley (UCB)	United States	90.8	48.5	45.2	68.7
13	University of California, Los Angeles (UCLA)	United States	55.9	51.3	43.0	51.1
4	Massachusetts Institute of Technology (MIT)	United States	97.4	61.2	39.5	72.8
8	Imperial College London	United Kingdom	70.2	63.8	33.2	57.8
3	University of Oxford	United Kingdom	91.6	75.7	39.9	72.9
2	Harvard University	United States	91.6	78.0	53.8	77.5
1	University of Cambridge	United Kingdom	100.0	100.0	41.3	82.4

Sort By: Citations score

Rank	University	Country	Academic score	Employer score	Citations score	Total score
11	University of Tokyo	Japan	79.7	34.6	22.7	53.6
8	Imperial College London	United Kingdom	70.2	63.8	33.2	57.8
7	California Institute of Technology (Caltech)	United States	81.5	40.7	39.2	60.7
4	Massachusetts Institute of Technology (MIT)	United States	97.4	61.2	39.5	72.8
3	University of Oxford	United Kingdom	91.6	75.7	39.9	72.9
1	University of Cambridge	United Kingdom	100.0	100.0	41.3	82.4
13	University of California, Los Angeles (UCLA)	United States	55.9	51.3	43.0	51.1
9	Princeton University	United States	76.4	30.3	44.1	57.5
5	University of California, Berkley (UCB)	United States	90.8	48.5	45.2	68.7
10	ETH Zürich (Swiss Federal Institute of Technology)	Switzerland	69.6	42.2	46.9	57.3
6	Stanford University	United States	81.7	38.4	53.0	64.4
12	University of Chicago	United States	57.1	34.4	53.3	51.4
2	Harvard University	United States	91.6	78.0	53.8	77.5
15	Columbia University	United States	46.2	44.0	61.9	50.5
14	University of Melbourne	Australia	46.6	41.5	64.4	50.9

Sort By: Total score

Rank	University	Country	Academic score	Employer score	Citations score	Total score
15	Columbia University	United States	46.2	44.0	61.9	50.5
14	University of Melbourne	Australia	46.6	41.5	64.4	50.9
13	University of California, Los Angeles (UCLA)	United States	55.9	51.3	43.0	51.1
12	University of Chicago	United States	57.1	34.4	53.3	51.4
11	University of Tokyo	Japan	79.7	34.6	22.7	53.6
10	ETH Zürich (Swiss Federal Institute of Technology)	Switzerland	69.6	42.2	46.9	57.3
9	Princeton University	United States	76.4	30.3	44.1	57.5
8	Imperial College London	United Kingdom	70.2	63.8	33.2	57.8
7	California Institute of Technology (Caltech)	United States	81.5	40.7	39.2	60.7
6	Stanford University	United States	81.7	38.4	53.0	64.4
5	University of California, Berkley (UCB)	United States	90.8	48.5	45.2	68.7
4	Massachusetts Institute of Technology (MIT)	United States	97.4	61.2	39.5	72.8
3	University of Oxford	United Kingdom	91.6	75.7	39.9	72.9
2	Harvard University	United States	91.6	78.0	53.8	77.5
1	University of Cambridge	United Kingdom	100.0	100.0	41.3	82.4

Question 23

For each of the following statements, select *Yes* if the statement is true based on the information provided; otherwise select *No*.

	Yes	No	
23A.	○	○	For each of the United States universities listed, the employer score is less than the total score.
23B.	○	○	For only one university listed, the employer score and the citations score are both greater than 50.
23C.	○	○	University of Tokyo is the university for which the magnitude of the difference between the academic score and the total score is greatest.

Data

The table lists data on the 22 earthquakes of magnitude 7 or greater on the Richter Scale during a recent year. Times are given in hours, minutes, and seconds on the 24-hour Greenwich Mean Time (GMT) clock and correspond to standard time at Greenwich, United Kingdom (UK). Latitude, measured in degrees, is 0 at the equator, increases from 0 to 90 proceeding northward to the North Pole, and decreases from 0 to –90 proceeding southward to the South Pole. Longitude, also measured in degrees, is 0 at Greenwich, UK, increases from 0 to 180 from west to east in the Eastern Hemisphere, and decreases from 0 to –180 from east to west in the Western Hemisphere.

Sort By: Date

Date	Time (GMT)	Magnitude	Depth (km)	Latitude	Longitude
3 January	22:36:28	7.1	25	–8.799	157.346
12 January	21:53:10	7.0	13	18.443	–72.571
26 February	20:31:27	7.0	25	25.930	128.425
27 February	06:34:12	8.8	23	–36.122	–72.898
4 April	22:40:43	7.2	4	32.297	–115.278
6 April	22:15:02	7.8	31	2.383	97.048
9 May	05:59:42	7.2	38	3.748	96.018
27 May	17:14:47	7.1	31	–13.698	166.643
12 June	19:26:50	7.5	35	7.881	91.936
16 June	03:16:28	7.0	18	–2.174	136.543
18 July	13:34:59	7.3	35	–5.931	150.590
23 July	22:08:11	7.3	607	6.718	123.409
23 July	22:51:12	7.6	586	6.486	123.467
23 July	23:15:10	7.4	641	6.776	123.259
4 August	22:01:44	7.0	44	–5.746	150.765
10 August	05:23:45	7.3	25	–17.541	168.069
12 August	11:54:16	7.1	207	–1.266	–77.306
3 September	16:35:48	7.0	12	–43.522	171.830
29 September	17:11:26	7.0	26	–4.963	133.760
25 October	14:42:22	7.8	20	–3.487	100.082
21 December	17:19:41	7.4	14	26.901	143.698
25 December	13:16:37	7.3	16	–19.702	167.947

Sort By: Time (GMT)

Date	Time (GMT)	Magnitude	Depth (km)	Latitude	Longitude
16 June	03:16:28	7.0	18	–2.174	136.543
10 August	05:23:45	7.3	25	–17.541	168.069
9 May	05:59:42	7.2	38	3.748	96.018
27 February	06:34:12	8.8	23	–36.122	–72.898
12 August	11:54:16	7.1	207	–1.266	–77.306
25 December	13:16:37	7.3	16	–19.702	167.947
18 July	13:34:59	7.3	35	–5.931	150.590
25 October	14:42:22	7.8	20	–3.487	100.082
3 September	16:35:48	7.0	12	–43.522	171.830
29 September	17:11:26	7.0	26	–4.963	133.760
27 May	17:14:47	7.1	31	–13.698	166.643
21 December	17:19:41	7.4	14	26.901	143.698
12 June	19:26:50	7.5	35	7.881	91.936
26 February	20:31:27	7.0	25	25.930	128.425
12 January	21:53:10	7.0	13	18.443	–72.571
4 August	22:01:44	7.0	44	–5.746	150.765
23 July	22:08:11	7.3	607	6.718	123.409
6 April	22:15:02	7.8	31	2.383	97.048
3 January	22:36:28	7.1	25	–8.799	157.346
4 April	22:40:43	7.2	4	32.297	–115.278
23 July	22:51:12	7.6	586	6.486	123.467
23 July	23:15:10	7.4	641	6.776	123.259

Sort By: Magnitude

Date	Time (GMT)	Magnitude	Depth (km)	Latitude	Longitude
12 January	21:53:10	7.0	13	18.443	–72.571
26 February	20:31:27	7.0	25	25.930	128.425
16 June	03:16:28	7.0	18	–2.174	136.543
4 August	22:01:44	7.0	44	–5.746	150.765
3 September	16:35:48	7.0	12	–43.522	171.830
29 September	17:11:26	7.0	26	–4.963	133.760
3 January	22:36:28	7.1	25	–8.799	157.346
27 May	17:14:47	7.1	31	–13.698	166.643
12 August	11:54:16	7.1	207	–1.266	–77.306
4 April	22:40:43	7.2	4	32.297	–115.278
9 May	05:59:42	7.2	38	3.748	96.018
18 July	13:34:59	7.3	35	–5.931	150.590
23 July	22:08:11	7.3	607	6.718	123.409
10 August	05:23:45	7.3	25	–17.541	168.069
25 December	13:16:37	7.3	16	–19.702	167.947
23 July	23:15:10	7.4	641	6.776	123.259
21 December	17:19:41	7.4	14	26.901	143.698
12 June	19:26:50	7.5	35	7.881	91.936
23 July	22:51:12	7.6	586	6.486	123.467
6 April	22:15:02	7.8	31	2.383	97.048
25 October	14:42:22	7.8	20	–3.487	100.082
27 February	06:34:12	8.8	23	–36.122	–72.898

Sort By: Depth (km)

Date	Time (GMT)	Magnitude	Depth (km)	Latitude	Longitude
4 April	22:40:43	7.2	4	32.297	–115.278
3 September	16:35:48	7.0	12	–43.522	171.830
12 January	21:53:10	7.0	13	18.443	–72.571
21 December	17:19:41	7.4	14	26.901	143.698
25 December	13:16:37	7.3	16	–19.702	167.947
16 June	03:16:28	7.0	18	–2.174	136.543
25 October	14:42:22	7.8	20	–3.487	100.082
27 February	06:34:12	8.8	23	–36.122	–72.898
3 January	22:36:28	7.1	25	–8.799	157.346
26 February	20:31:27	7.0	25	25.930	128.425
10 August	05:23:45	7.3	25	–17.541	168.069
29 September	17:11:26	7.0	26	–4.963	133.760
6 April	22:15:02	7.8	31	2.383	97.048
27 May	17:14:47	7.1	31	–13.698	166.643
12 June	19:26:50	7.5	35	7.881	91.936
18 July	13:34:59	7.3	35	–5.931	150.590
9 May	05:59:42	7.2	38	3.748	96.018
4 August	22:01:44	7.0	44	–5.746	150.765
12 August	11:54:16	7.1	207	–1.266	–77.306
23 July	22:51:12	7.6	586	6.486	123.467
23 July	22:08:11	7.3	607	6.718	123.409
23 July	23:15:10	7.4	641	6.776	123.259

Sort By: Latitude

Date	Time (GMT)	Magnitude	Depth (km)	Latitude	Longitude
3 September	16:35:48	7.0	12	−43.522	171.830
27 February	06:34:12	8.8	23	−36.122	−72.898
25 December	13:16:37	7.3	16	−19.702	167.947
10 August	05:23:45	7.3	25	−17.541	168.069
27 May	17:14:47	7.1	31	−13.698	166.643
3 January	22:36:28	7.1	25	−8.799	157.346
18 July	13:34:59	7.3	35	−5.931	150.590
4 August	22:01:44	7.0	44	−5.746	150.765
29 September	17:11:26	7.0	26	−4.963	133.760
25 October	14:42:22	7.8	20	−3.487	100.082
16 June	03:16:28	7.0	18	−2.174	136.543
12 August	11:54:16	7.1	207	−1.266	−77.306
6 April	22:15:02	7.8	31	2.383	97.048
9 May	05:59:42	7.2	38	3.748	96.018
23 July	22:51:12	7.6	586	6.486	123.467
23 July	22:08:11	7.3	607	6.718	123.409
23 July	23:15:10	7.4	641	6.776	123.259
12 June	19:26:50	7.5	35	7.881	91.936
12 January	21:53:10	7.0	13	18.443	−72.571
26 February	20:31:27	7.0	25	25.930	128.425
21 December	17:19:41	7.4	14	26.901	143.698
4 April	22:40:43	7.2	4	32.297	−115.278

Sort By: Longitude

Date	Time (GMT)	Magnitude	Depth (km)	Latitude	Longitude
4 April	22:40:43	7.2	4	32.297	–115.278
12 August	11:54:16	7.1	207	–1.266	–77.306
27 February	06:34:12	8.8	23	–36.122	–72.898
12 January	21:53:10	7.0	13	18.443	–72.571
12 June	19:26:50	7.5	35	7.881	91.936
9 May	05:59:42	7.2	38	3.748	96.018
6 April	22:15:02	7.8	31	2.383	97.048
25 October	14:42:22	7.8	20	–3.487	100.082
23 July	23:15:10	7.4	641	6.776	123.259
23 July	22:08:11	7.3	607	6.718	123.409
23 July	22:51:12	7.6	586	6.486	123.467
26 February	20:31:27	7.0	25	25.930	128.425
29 September	17:11:26	7.0	26	–4.963	133.760
16 June	03:16:28	7.0	18	–2.174	136.543
21 December	17:19:41	7.4	14	26.901	143.698
18 July	13:34:59	7.3	35	–5.931	150.590
4 August	22:01:44	7.0	44	–5.746	150.765
3 January	22:36:28	7.1	25	–8.799	157.346
27 May	17:14:47	7.1	31	–13.698	166.643
25 December	13:16:37	7.3	16	–19.702	167.947
10 August	05:23:45	7.3	25	–17.541	168.069
3 September	16:35:48	7.0	12	–43.522	171.830

Question 24

For each of the following statements, select *Yes* if the statement is true based on the information provided; otherwise select *No*.

	Yes	No	
24A.	○	○	For the 22 earthquakes, the arithmetic mean of the depths is greater than the median of the depths.
24B.	○	○	More than half of the 22 earthquakes occurred north of the equator.
24C.	○	○	Exactly half of the earthquakes listed occurred between 10:00:00 and 20:00:00 GMT.

Question 25

Twenty-five adults reported the amount of time each spent exercising during a particular week. The results are summarized in the graph as follows: 5 respondents reported exercising for less than 1 hour, 3 respondents reported exercising for at least 1 hour but less than 2, and so on.

Based on the given information, use the drop-down menus to most accurately complete the following statements.

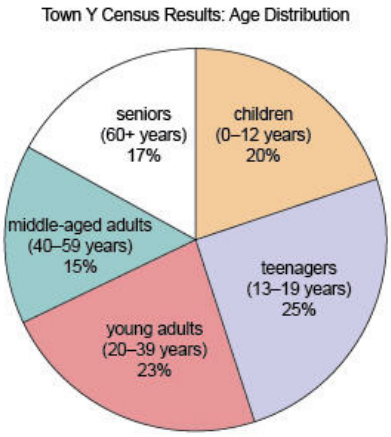
25A. The least possible value for the mean of the numbers of hours of exercise reported for the week is [Select...].

- Select...
- 3
- 3.12
- 3.48
- 3.98

25B. The number of respondents who exercised on average less than one-half hour per day during the week is between [Select...], inclusive.

- Select...
- 0 and 5
- 5 and 8
- 8 and 10
- 10 and 14
- 14 and 19

Question 26



A recent census revealed the age distribution of the residents of Town Y, shown in the graph. Since the census was performed, no resident has moved into or away from Town Y and there have been no recorded births or deaths.

Based on the given information, use the drop-down menus to most accurately complete the following statements.

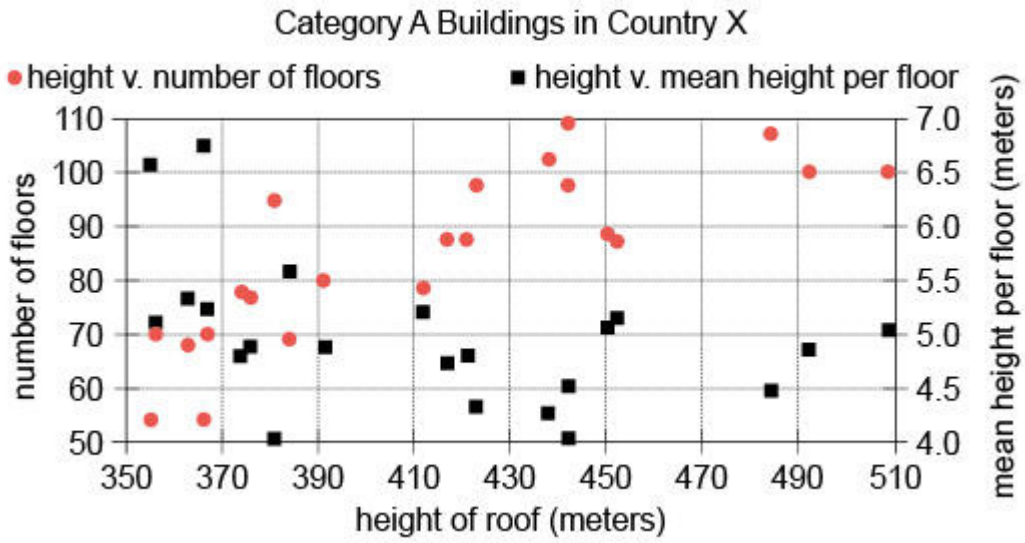
26A. The census indicates that Select... times as many residents were children or teenagers as were seniors.

- Select...
- 1.17
- 1.47
- 2.65
- 3.00

26B. If, at the time of the census, there were 540 more people aged 0-39 than people aged 40 or greater, then the population of Town Y at the time of the census was Select... .

- Select...
- 1,080
- 1,500
- 2,400
- 4,000

Question 27



In Country X, a building is in Category A if it has a roof height of at least 350 meters. In the graph, each of the 22 Category A buildings is represented by two points arranged vertically: one representing the comparison of the height of the building's roof to the number of floors (red circles), the other representing the comparison of the height of the building's roof to the mean height per floor (black squares).

Based on the given information, use the drop-down menus to most accurately complete the following statements about Category A buildings in Country X.

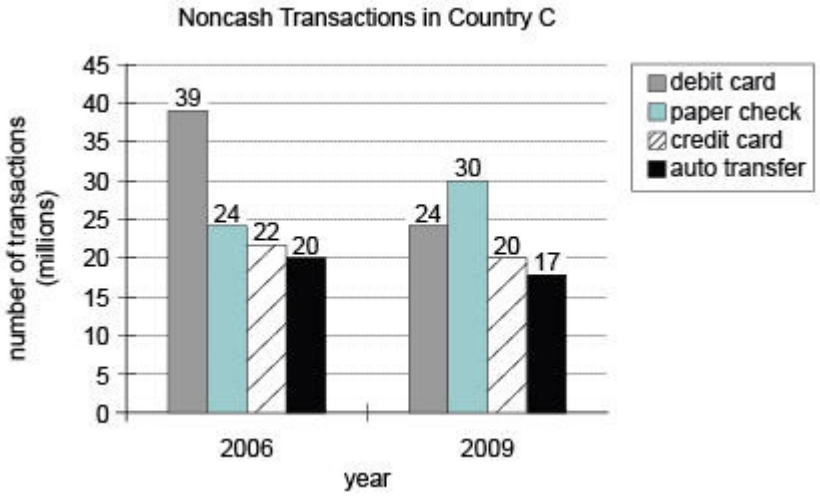
27A. The building with the greatest mean height per floor has a roof height between Select... meters.

- Select...
- 350 and 370
- 430 and 450
- 470 and 490
- 490 and 510

27B. There is a Select... correlation between the number of floors and the mean height per floor.

- Select...
- strong positive
- negligible
- strong negative

Question 28



In Country C, the number of transactions made by various noncash methods in 2006 and 2009 are shown in the graphic. All other transactions were made with cash.

Use the drop-down menus to complete the following statements about Country C so that they are consistent with the given information.

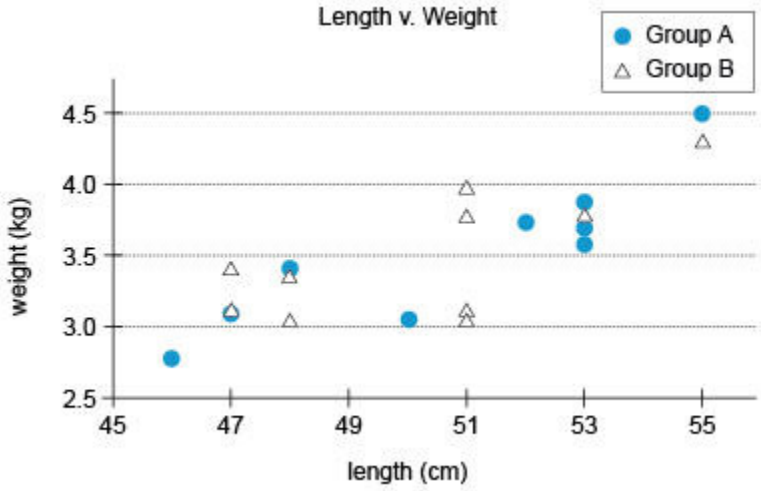
28A. The number of Select... transactions increased by 25% from 2006 to 2009.

Select...
debit card
paper check
credit card
auto transfer

28B. If the total value of all credit card transactions in 2009 was 10% more than the total value of all credit card transactions in 2006, then the average (arithmetic mean) value of credit card transactions increased by Select... % from 2006 to 2009.

Select...
2.0
17.4
21.0
22.0

Question 29



During a four-day period, a height measurement and a weight measurement were recorded shortly after delivery for each baby born in a particular hospital. The 19 babies in the study were divided into two groups, Group A and Group B. The chart shows the length, in centimeters (cm), and weight, in kilograms (kg), for each of the 19 babies.

Based on the given information, use the drop-down menus to most accurately complete the following statements.

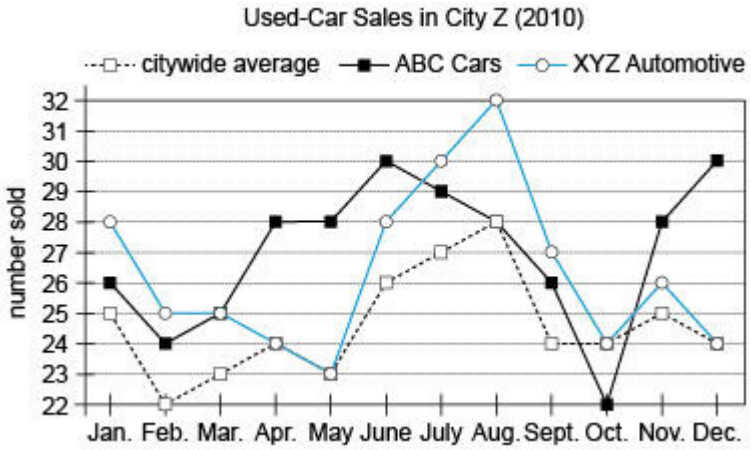
29A. The correlation between length and weight for the babies in the study is Select...

- Select...
- strongly positive
- negligible
- strongly negative

29B. If a baby with weight less than 3.5 kg were selected at random, the probability that the baby would be a part of Group A is Select...

- Select...
- 0.33
- 0.40
- 0.44
- 0.60
- 0.67

Question 30



In 2010, there were four used-car dealers in City Z. The graphic shows the monthly sales data for 2010 for two of those dealers as well as the citywide average for used-car dealers for those months.

Based on the given information, use the drop-down menus to most accurately complete the following statements.

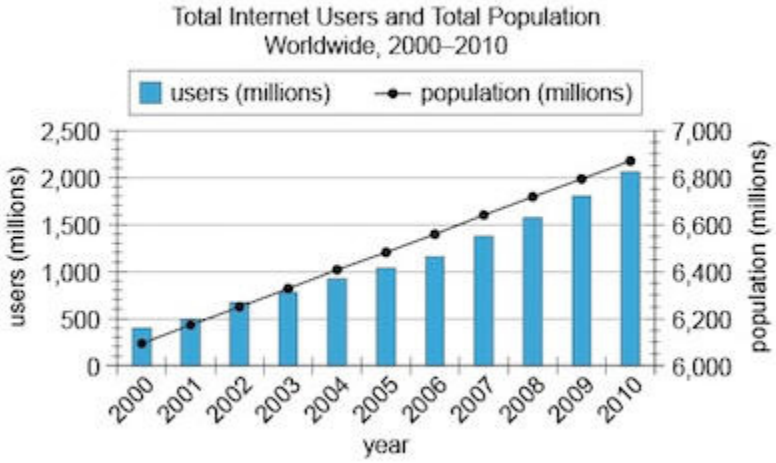
30A. ABC Cars and XYZ Automotive accounted for Select... half of all used-car sales in City Z for 2010.

- Select...
- less than
- exactly
- more than

30B. In June 2010, the two used-car dealers that are not specified on the graph sold a total of exactly Select... cars.

Select...
23
46
52
58

Question 31



The graph shows the total number of Internet users and the total population worldwide for each of the years 2000–2010.

From each drop-down menu, select the option that creates the most accurate statement based on the information provided.

31A. The percent increase in the total number of Internet users from 2002 to 2007 was approximately Select... %.

Select...
50
100
200
300

31B. The number of Internet users per 100 people increased by approximately Select... from 2000 to 2010.

Select...
6
12
24
30
36

Question 32

On Days 1 through 4 of a recent week, Product X was out of stock at Retailer R. *Day 1 shoppers* are those shoppers who came to Retailer R on Day 1 of that week seeking Product X. For each of the first 3 days of that week, the graph shows the subsequent behavior of all the Day 1 shoppers who came to Retailer R seeking Product X on that day. Shoppers at Retailer R who purchased a different item in lieu of Product X paid an average of 30% more for the item.

From each drop-down menu, select the option that creates the most accurate statement based on the information provided.

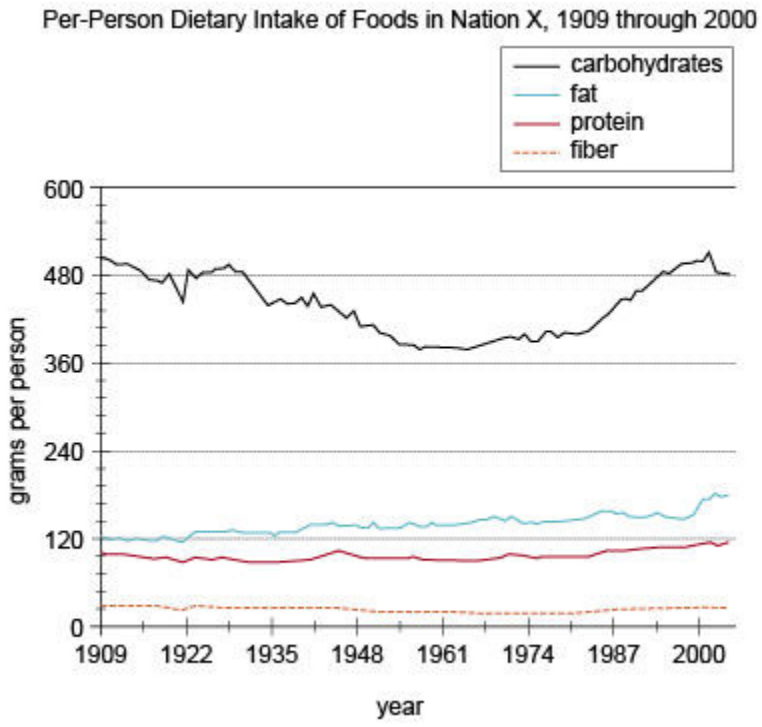
32A. Select... % of Day 1 shoppers returned to the store on Day 3.

- Select...
- Fewer than 1
- Between 1 and 10
- More than 10

32B. Shoppers at Retailer R who purchased substitute items from other manufacturers on Day 1 paid a total amount that was approximately Select... % of the total all Day 1 shoppers would have paid had each of them been able to purchase Product X on Day 1.

- Select...
- 60
- 78
- 100
- 130

Question 33



The graph depicts the per-person dietary intake of foods in 4 categories for the people of Nation X for the years 1909 through 2000. A decline in consumption in all 4 categories strongly suggests an overall food shortage rather than a simple change in dietary pattern.

From each drop-down menu, select the option that creates the most accurate statement about food consumption in Nation X based on the information provided.

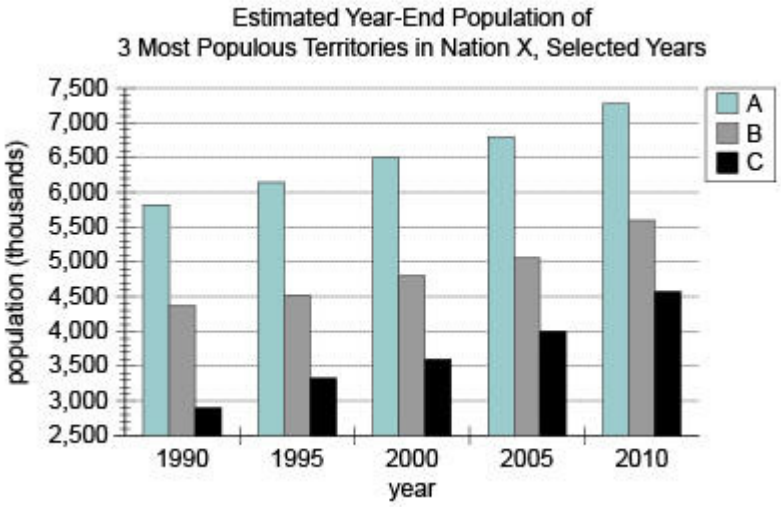
33A. The graph suggests that Nation X most likely experienced a food shortage shortly before the year [Select...].

- Select...
- 1922
- 1961
- 2000

33B. For the year that the total dietary intake of carbohydrates was lowest, the per-person intake of carbohydrates was approximately [Select...] times the per-person intake of dietary fiber.

- Select...
- 3
- 9
- 18
- 27

Question 34



The graph shows the estimated year-end population for the 3 most populous territories in Nation X in 5 selected years. The estimated year-end population of Nation X was 17,000,000 in 1990 and 22,500,000 in 2010.

From each drop-down menu, select the option that creates the most accurate statement based on the information provided.

34A. The increase in the estimated year-end population of Territory C from 1990 to 2010 accounts for approximately [Select... / 20 / 30 / 40 / 60] % of the increase in the estimated year-end population of Nation X over the same period.

34B. In 2010, the estimated total year-end population of the 3 territories was [Select... / between 70% and 80% / between 80% and 90% / over 90%] of the estimated year-end population of Nation X.

Question 35

Rock varnish is typically rich in iron and manganese, with the presence of manganese due to bacteria on the surface of the rock. Because the bacteria would not survive on the surface of rocks in the colder, continuously frozen, reaches of Antarctica, scientists were not surprised to discover that rock varnish in the Thiel Mountains area of Antarctica consists only of limonite, a form of oxidized iron. This had penetrated from the surfaces of the rocks into the cracks. However, although moisture is essential to the movement of limonite, snow has not melted in the Thiel Mountains in recent times.

Indicate which statement in the table the given information most strongly suggests is *true*, and the statement that the given information most strongly suggests is *false*. Make only two selections, one in each column.

	35A.	35B.	
	True	False	
A	○	○	Moisture is required for the presence of significant amounts of manganese in the environment.
B	○	○	Moisture is not required for the presence of significant amounts of manganese in the environment.
C	○	○	When temperatures in a continuously frozen location increase to above freezing, cracks in rocks there begin to take in rock varnish containing significant amounts of manganese.
D	○	○	Rock varnish that is especially rich in iron is mostly found in extreme cold.
E	○	○	Manganese is unable to penetrate into cracks in significant amounts.
F	○	○	Temperatures on rocks in the Thiel Mountains were above freezing at some point in the past.

Question 36

A city is hosting a table tennis tournament for its residents. Each team has exactly two players, and each player is on exactly one team. In each round, each team plays exactly one other team and either wins or loses. The winning team advances to the next round and the losing team is eliminated. No team or player drops out except by losing a game. The tournament is in progress, and exactly 512 players participated in the first round.

From the available options, select a number of tournament rounds and a number of teams such that after the specified number of rounds there will be the specified number of teams remaining in the tournament. Make only two selections, one in each column.

	36A.	36B.	
	Rounds completed	Teams remaining	
A	○	○	2
B	○	○	4
C	○	○	8
D	○	○	16
E	○	○	32

Question 37

Naturalist: The decline of coral reefs has various causes. One contributing factor is predation on coral by organisms such as the crown-of-thorns sea star, whose preferred food source is coral polyps. Human fishing practices have decreased the sea star's predators, such as the harlequin shrimp. It is also possible that runoff containing nutrients for phytoplankton has resulted in larger phytoplankton blooms: the crown-of-thorns sea star gladly eats phytoplankton.

Indicate in the table which cause-and-effect sequence would most likely, according to the naturalist, result in coral reef decline. Make only two selections, one in each column.

	37A.	37B.	
	Cause	Effect	
A	○	○	An increase in phytoplankton
B	○	○	A decrease in phytoplankton
C	○	○	An increase in crown-of-thorns sea stars
D	○	○	A decrease in crown-of-thorns sea stars
E	○	○	An increase in harlequin shrimp

Question 38

For each value of y greater than $2\sqrt{3}$, the function $f(x)$ is such that the equation $f(x) = y$ has the form $x = \frac{y^2 + 12}{y}$.

Select one value for a and one value for b such that the given information implies $f(a) = b$. Make only two selections, one in each column.

	38A.	38B.	
	a	b	
A	○	○	1
B	○	○	2
C	○	○	4
D	○	○	6
E	○	○	8

Question 39

Archaeologist: There were several porcelain-production centers in 18th-century Britain, among them Bristol, Plymouth, and New Hall. Each center developed a unique recipe for its porcelain that might include flint glass, soapstone, bone ash, clay, quartz, and so on. We will therefore be able to determine, on the basis of compositional analysis, where the next cup we recover from this archaeological site was made.

Indicate two different statements as follows: one statement identifies an *assumption required* by the archaeologist's argument and the other identifies a *possible fact* that, if true, would, provide significant logical support for the required assumption.

	39A.	39B.	
	Assumption required	Possible fact	
A	○	○	Other cups have been recovered from the archaeological site, all of which were made of porcelain.
B	○	○	Some of the cups recovered from the archeological site were not made of porcelain.
C	○	○	The next cup to be recovered from the site will likely be made of porcelain.
D	○	○	Porcelain makers often traveled between centers, experimenting with one another's recipes.
E	○	○	There was considerable overlap of materials in the recipes used by the various centers.
F	○	○	Most porcelain in 18th-century Britain was made at one of the several centers.

Question 40

Adiliah, Bao, Davi, Laszlo, Saleema, and Yarah work in a firm's legal department. Adiliah supervises Bao and Davi, Davi supervises Laszlo, and Laszlo supervises Saleema and Yarah. These are the only supervisory relationships involving these 6 employees. Each document that the department processes must be initially reviewed by exactly 1 department member. Each document reviewed by a department member must then be reviewed by that person's supervisor. No other rules require anyone else to review any document. Anyone not required to review a given document will not review it.

Select *Laszlo among reviewers* for the maximum number of department members that could have reviewed a single document if Laszlo was among the reviewers. Select *Adiliah among reviewers* for the maximum number of department members that could have reviewed a single document if Adiliah was among the reviewers. Make only two selections, one in each column.

	40A.	40B.	
	Lazlo among reviewers	Adiliah among reviewers	
A	○	○	1
B	○	○	2
C	○	○	3
D	○	○	4
E	○	○	5
F	○	○	6

Question 41

Archaeologist: Although thin-walled pottery is better able to resist the damaging effects of thermal stress resulting from being placed over a fire, such pottery is more prone to breaking during transport. We can therefore make predictions about pottery use by a group of people on the basis of a certain lifestyle characteristic of the group.

The archaeologist suggests that a certain type of *prediction* about a group can be made on the basis of the group having a certain type of *characteristic*. Indicate in the table the possible *characteristic* and *prediction* that most strongly conform to the archaeologist's suggestion. Make only two selections, one in each column.

	41A.	41B.	
	Characteristic	Prediction	
A	○	○	The group is sedentary rather than nomadic.
B	○	○	The group has not discovered pottery.
C	○	○	The group uses thin-walled pots.
D	○	○	The group uses fire for warmth and protection.
E	○	○	The group uses thick-walled pots.

Question 42

Consider a right circular cylinder for which the following quantities are all numerically equal: the height, in meters; one-fourth of the volume, in cubic meters; the area of the circular base, in square meters.

In the table, select a value for the diameter of the circular base and a value for the height, where both are measured in meters, so that the two values are jointly consistent with the information provided. Make only two selections, one in each column.

	42A.	42B.	
	Diameter	Height	
A	○	○	$\frac{2}{\sqrt{\pi}}$
B	○	○	$\frac{4}{\sqrt{\pi}}$
C	○	○	4
D	○	○	$\frac{16}{\pi}$
E	○	○	4π
F	○	○	16

Question 43

Professor A: The aid industry should begin to limit its efforts to spending on primary schools in the poorest areas, providing medicines and other basic supplies for health care such as mosquito nets, and to a few key agricultural initiatives.

Professor B: Much education work has been ineffective. A village or town with poor schooling may be better off getting a road than a teacher. Once local farmers can transport produce to market they will be willing to pay for schools—and to make sure the schools succeed.

Suppose that the professors' statements express their genuine opinions. Select statements (1) and (2) as follows: Professor A would likely disagree with (1) and Professor B would take (2) to present logical support for (1). Select only two statements, one per column.

	43A.	43B.	
	(1)	(2)	
A	○	○	The aid industry should focus less on the areas of health and agriculture than it now does.
B	○	○	The aid industry should focus more on primary education than it now does.
C	○	○	The aid industry should focus its spending less on primary education than it now does.
D	○	○	Projects in health and agriculture are more likely to be successful if they are not paid for by the aid industry.
E	○	○	Projects in education are more likely to be successful if they are paid for by the aid industry.
F	○	○	Projects in education are more likely to be successful if they are paid for by local people.

Question 44

A car is traveling on a straight stretch of roadway, and the speed of the car is increasing at a constant rate. At time 0 seconds, the speed of the car is v_0 meters per second; 10 seconds later, the front bumper of the car has traveled 125 meters and the speed of the car is v_{10} meters per second.

In the table, select values of v_0 and v_{10} that are together consistent with the information provided. Make only two selections, one in each column.

	44A.	44B.	
	v_0	v_{10}	
A	○	○	5
B	○	○	18
C	○	○	20
D	○	○	36
E	○	○	72

Question 45

Journalist: The end of the Triassic, the geologic period that extended from about 250 to 200 million years ago, has traditionally been blamed on volcanic eruptions that went on for 600,000 years. However, a researcher has recently suggested that these eruptions were only an indirect cause. By analyzing the isotopic composition of hydrocarbon molecules from plant waxes from the period, he discovered what looks like a spike in the amount of nonbiological carbon in the atmosphere, lasting between 10,000 and 20,000 years. The researcher believes that the release of methane—a carbon-containing greenhouse gas much stronger than carbon dioxide—stored at the bottom of the ocean was the direct cause of the end of the Triassic.

The journalist suggests that a certain causal sequence may have brought about the end of the Triassic period. Identify in the table the sequence of *cause* and *effect* most strongly suggested by the journalist to have resulted in the end of the Triassic. Make only two selections, one per column.

	45A.	45B.	
	Cause	Effect	
A	○	○	The emissions of volcanoes into the atmosphere
B	○	○	The extinction of many oceanic biological species
C	○	○	The eruption of volcanoes
D	○	○	The release of carbon dioxide into the atmosphere
E	○	○	The release of methane from the bottom of the ocean

Question 46

For each positive integer n, the quantity s_n is defined such that $s_{n+2} = (s_n)^2 - s_{n+1}$. In addition, $s_2 = 1$.

In the table, select values for s_1 and s_4 that are jointly compatible with these conditions. Select only two values, one in each column.

	46A.	46B.	
	s_1	s_4	
A	○	○	–12
B	○	○	–7
C	○	○	–3
D	○	○	–1
E	○	○	0

Question 47

In an experiment, researchers posed simple questions in geometry to children from varied backgrounds. One group consisted of 7-to-13-year-old children of the Mundurucú, an isolated indigenous group in the Amazon basin. The Mundurucú children, who had no formal training in geometry, answered the questions just as quickly and accurately as did French children of the same ages who did have formal training in geometry. In contrast, 5-year-old North American children had much more trouble answering the questions. The researchers concluded that some basic geometric knowledge is innate, but this innate knowledge typically develops only after age 5.

In the table, select the statement that would, if true, most strengthen the researchers' conclusion and most weaken it, respectively. Make only two selections, one in each column.

	47A.	47B.	
	Most strengthen	Most weaken	
A	○	○	North American children 7 to 13 years old had much more trouble answering the questions than did the Mundurucú of the same ages.
B	○	○	None of the 5-year-old North American children had ever studied any geometry.
C	○	○	Mundurucú children who were 5 years old had just as much trouble answering the questions as did the 5-year-old North American children.
D	○	○	The researchers posed the same questions to 5-year-old French and Mundurucú children as they posed to the 7-to-13-year-old children.
E	○	○	Most of the children studied answered one or more of the questions incorrectly.

Question 48

At XYZ Inc., an employee receives a verbal warning upon accumulating at least 3 unexcused absences within any 365-day period and a written reprimand upon accumulating at least 4 such absences. For any single 8-hour workday, missing between 10 minutes and 2 hours of work counts as one-third of an absence, missing between 2 hours and 4 hours of work counts as half an absence, and missing more than 4 hours counts as a full absence. However, an employee may stay late to make up for up to 1 hour of an unexcused absence on the same day.

The table contains descriptions of the unexcused absences of 5 employees of XYZ Inc. Assume that in each case the employee had no other unexcused absences and made up no other time. In the table, select a description of an employee who qualified for a verbal warning but not a written reprimand, and select a description of an employee who qualified for a written reprimand. Make only two selections, one in each column.

	48A.	48B.	
	Verbal warning	Written reprimand	
A	○	○	Absent all day on 5 April 2010, 8 June 2010, 17 April 2011, and 14 June 2011
B	○	○	Absent 4.5 hours but stayed 1 hour late on 13 May 2010; absent all day on 2 June 2010, 1 May 2011, and 21 July 2011
C	○	○	Absent 4.5 hours on 19 March 2010; stayed 1 hour late on 20 March 2010; absent all day on 8 February 2011 and 9 February 2011; arrived 40 minutes late on 17 April 2011
D	○	○	Absent 3.5 hours on 13 September 2010; absent 1 hour on 15 September 2010; absent 6 hours on 16 September 2010; absent 2.5 hours on 18 September 2010; absent 1 hour on 19 September 2010
E	○	○	Absent 3 hours on 7 July 2010; absent 2.5 hours on 13 September 2010; absent all day on 31 January 2011 and 4 July 2011; absent 5 hours on 12 March 2011

Question 49

Metro Ballet Company presents high-quality productions of traditional, classical ballet. For the past several years, however, the company's overall profits have been declining, and ticket sales have been flat. Annual audience surveys indicate that a majority of those who attend Metro Ballet productions consistently enjoy the performances and prefer classical ballet to other forms of dance; almost all of them have been attending Metro Ballet for several years. General surveys of area residents indicate, however, that very few are aware of Metro Ballet productions, and most imagine that the performances are boring and the tickets too expensive. In an effort to appeal to a wider audience, over the past decade the company has spent increasing amounts of money on spectacular stage productions, while lowering ticket prices.

In the first column of the table, select the strategy that, in the absence of the other alternatives listed, would lead most directly to decreasing Metro Ballet's expenses for its classical ballet productions. In the second column, select the strategy that, in the absence of the other alternatives listed, would constitute the most direct approach to solving the problem of increasing audience size for Metro Ballet's classical ballet productions. Make only two selections, one in each column.

	49A.	49B.	
	Decrease expenses	Increase audience size	
A	○	○	Obtain public funding to double the spending on stage productions without increasing ticket prices
B	○	○	Return spending on productions to levels of several years ago
C	○	○	Expand productions to include modern, folk, and tap dance traditions
D	○	○	Offer special discounts to reward people who have attended the greatest number of performances
E	○	○	Mount a local advertising campaign emphasizing the affordability and excitement of Metro Ballet's spectacular stage productions

Question 50

A mattress company has two stores, one in City X and the other in City Z. The company has advertised equally in newspapers in both cities, but has advertised twice as much on the radio in City Z as in City X. The two cities have similar populations and economies and the sales at each store have been roughly equal. A consultant claims this shows that the radio advertising has not improved mattress sales.

In the table, select changes that the company could make in City X and City Z, respectively, that together would probably be most helpful in testing the consultant's claim. Make only two selections, one in each column.

	50A.	50B.	
	City X	City Z	
A	○	○	Double newspaper advertising
B	○	◉	Eliminate newspaper advertising
C	◉	○	Eliminate radio advertising
D	○	○	Change the content of radio advertising
E	○	○	Add television advertising