3. Kirmani's research, as described in the passage, suggests which of the following regarding consumers' expectations about the quality of advertised products?

(A) Those expectations are likely to be highest if a manufacturer runs both black-and-white and color advertisements for the same product.

(B) Those expectations can be shaped by the presence of color in an advertisement as well as by the frequency with which an advertisement appears.

(C) Those expectations are usually high for frequently advertised new brands but not for frequently advertised familiar brands.

(D) Those expectations are likely to be higher for products whose black-and-white advertisements are often repeated than for those whose color advertisements are less often repeated.

(E) Those expectations are less definitively shaped by the manufacturer's advertisements than by information that consumers gather from other sources.

4. Kirmani's third study, as described in the passage, suggests which of the following conclusions about a black-and-white advertisement?

(A) It can be repeated more frequently than a comparable color advertisement could before consumers begin to suspect low manufacturer confidence in the quality of the advertised product.

(B) It will have the greatest impact on consumers' perceptions of the quality of the advertised product if it appears during periods when a color version of the same advertisement is also being used.

(C) It will attract more attention from readers of the print publication in which it appears if it is used only a few times.

(D) It may be perceived by some consumers as more expensive than a comparable color advertisement.

(E) It is likely to be perceived by consumers as a sign of higher manufacturer confidence in the quality of the advertised product than a comparable color advertisement would be.

5. The passage suggests that Kirmani would be most likely to agree with which of the following statements about consumers' perceptions of the relationship between the frequency with which a product is advertised and the product's quality?

(A) Consumers' perceptions about the frequency with which an advertisement appears are their primary consideration when evaluating an advertisement's claims about product quality.

(B) Because most consumers do not notice the frequency of advertisement, it has little impact on most consumers' expectations regarding product quality.

(C) Consumers perceive frequency of advertisement as a signal about product quality only when the advertisement is for a product that is newly on the market.

(D) The frequency of advertisement is not always perceived by consumers to indicate that manufacturers are highly confident about their products' quality.

(E) Consumers who try a new product that has been frequently advertised are likely to perceive the advertisement's frequency as having been an accurate indicator of the product's quality.

Line The idea of the brain as an information processor—a machine manipulating blips of energy according to fathomable rules—has come to dominate neuroscience. However, one enemy of (5) the brain-as-computer metaphor is John R. Searle, a philosopher who argues that since computers simply follow algorithms, they cannot deal with important aspects of human thought such as meaning and content. Computers are syntactic, (10) rather than semantic, creatures. People, on the other hand, understand meaning because they have something Searle obscurely calls the causal powers of the brain.

Yet how would a brain work if not by reducing (15) what it learns about the world to information—some kind of code that can be transmitted from neuron to neuron? What else could meaning and content be? If the code can be cracked, a computer should be able to simulate it, at least in principle. But (20) even if a computer could simulate the workings of the mind, Searle would claim that the machine would not really be thinking; it would just be acting as if it were. His argument proceeds thus: if a computer were used to simulate a stomach, with (25) the stomach's churnings faithfully reproduced on a video screen, the machine would not be digesting real food. It would just be blindly manipulating the symbols that generate the visual display.

Suppose, though, that a stomach were simulated (30) using plastic tubes, a motor to do the churning, a supply of digestive juices, and a timing mechanism. If food went in one end of the device, what came out the other end would surely be digested food. Brains, unlike stomachs, are information processors, and if (35) one information processor were made to simulate another information processor, it is hard to see how one and not the other could be said to think. Simulated thoughts and real thoughts are made of the same element: information. The representations (40) of the world that humans carry around in their heads are already simulations. To accept Searle's argument, one would have to deny the most fundamental notion in psychology and neuroscience: that brains work by processing information.

6. The main purpose of the passage is to

(A) propose an experiment

(B) analyze a function

(C) refute an argument

(D) explain a contradiction

(E) simulate a process

7. Which of the following is most consistent with Searle's reasoning as presented in the passage?

(A) Meaning and content cannot be reduced to algorithms.

(B) The process of digestion can be simulated mechanically, but not on a computer.

(C) Simulated thoughts and real thoughts are essentially similar because they are composed primarily of information.

(D) A computer can use "causal powers" similar to those of the human brain when processing information.

(E) Computer simulations of the world can achieve the complexity of the brain's representations of the world.

8. The author of the passage would be most likely to agree with which of the following statements about the simulation of organ functions?

(A) An artificial device that achieves the functions of the stomach could be considered a valid model of the stomach.

(B) Computer simulations of the brain are best used to crack the brain's codes of meaning and content.

(C) Computer simulations of the brain challenge ideas that are fundamental to psychology and neuroscience.

(D) Because the brain and the stomach both act as processors, they can best be simulated by mechanical devices.

(E) The computer's limitations in simulating digestion suggest equal limitations in computer-simulated thinking.

20. In the past, most children who went sledding in the winter snow in Verland used wooden sleds with runners and steering bars. Ten years ago, smooth plastic sleds became popular; they go faster than wooden sleds but are harder to steer and slow. The concern that plastic sleds are more dangerous is clearly borne out by the fact that the number of children injured while sledding was much higher last winter than it was 10 years ago.

Which of the following, if true in Verland, most seriously undermines the force of the evidence cited?

(A) A few children still use traditional wooden sleds.

(B) Very few children wear any kind of protective gear, such as helmets, while sledding.

(C) Plastic sleds can be used in a much wider variety of snow conditions than wooden sleds can.

(D) Most sledding injuries occur when a sled collides with a tree, a rock, or another sled.

(E) Because the traditional wooden sleds can carry more than one rider, an accident involving a wooden sled can result in several children being injured.

Argument Evaluation

Situation Ten years ago, wooden sleds began to be replaced by plastic sleds that go faster but are harder to control. Plastic sleds are more dangerous than wooden sleds because more children suffered injuries last year than they did 10 years ago.

Reasoning *What weakens this argument?* This argument depends on a comparison of two kinds of sleds. Any evidence that would either strengthen or weaken the argument must indicate a comparison. Evidence that applies only to one kind of sled or to both kinds of sleds equally cannot weaken this argument. Consider the implications of the evidence presented in the answer choices. If plastic sleds can be used in a wider variety of conditions than wooden sleds can, then plastic sleds can be used more frequently. It is possible that more frequent use, rather than the sleds themselves, has led to more accidents.

A The limited use of some wooden sleds does not weaken the argument.

B The absence of protective gear would affect accidents with both kinds of sleds.

C **Correct.** This statement weakens the argument by providing an alternate explanation for the increased accidents.

D This statement is true of accidents with both kinds of sleds.

E This explains why wooden sleds may be dangerous but does not weaken the argument that plastic sleds are even more dangerous.

The correct answer is C.

21. Metal rings recently excavated from seventh-century settlements in the western part of Mexico were made using the same metallurgical techniques as those used by Ecuadorian artisans before and during that period. These techniques are sufficiently complex to make their independent development in both areas unlikely. Since the people of these two areas were in cultural contact, archaeologists hypothesize that the metallurgical techniques used to make the rings found in Mexico were learned by Mexican artisans from Ecuadorian counterparts.

Which of the following would it be most useful to establish in order to evaluate the archaeologists' hypothesis?

(A) Whether metal objects were traded from Ecuador to western Mexico during the seventh century

(B) Whether travel between western Mexico and Ecuador in the seventh century would have been primarily by land or by sea

(C) Whether artisans from western Mexico could have learned complex metallurgical techniques from their Ecuadorian counterparts without actually leaving western Mexico

(D) Whether metal tools were used in the seventh-century settlements in western Mexico

(E) Whether any of the techniques used in the manufacture of the metal rings found in western Mexico are still practiced among artisans in Ecuador today

Argument Evaluation

Situation Metal rings excavated from seventh-century settlements in western Mexico were made with the same complex techniques used in Ecuador before and during a period when the two cultures were known to be in contact. Mexican artisans are thought to have learned the techniques from Ecuadorian artisans.

Reasoning *What point could best be applied in evaluating this hypothesis?* Consider what specific information would help to assess the archaeologists' theory. It is given that the two areas had some cultural contact. If it were determined that metal objects were traded from one culture to the other, it could be possible that the metalworking techniques were passed along as well. Such evidence would be relevant to the hypothesis that Mexican artisans saw the work of their Ecuadorian counterparts and, from this exchange, learned the techniques to make the metal rings.

A **Correct.** This statement properly identifies information that would be useful in the evaluation of the archaeologists' hypothesis.

B The means of travel is irrelevant to the hypothesis about the source of the techniques.

C The hypothesis is not about where Mexican artisans learned the techniques, but whether they learned them from the Ecuadorians.

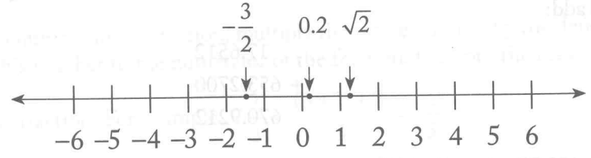
D The existence of metal tools provides no helpful information in establishing whether the Ecuadorians were the source of the metallurgical techniques.

E The comparison to the present day is irrelevant to the hypothesis.

The correct answer is A.

4. Real Numbers

All *real* numbers correspond to points on the number line and all points on the number line correspond to real numbers. All real numbers except zero are either positive or negative.



On a number line, numbers corresponding to points to the left of zero are negative and numbers corresponding to points to the right of zero are positive. For any two numbers on the number line, the number to the left is less than the number to the right; for example,

$-4 < -3 < -\frac{3}{2} < -1$, and $1 < \sqrt{2} < 2$.

To say that the number n is between 1 and 4 on the number line means that $n > 1$ and $n < 4$, that is, $1 < n < 4$. If n is "between 1 and 4, inclusive," then $1 \le n \le 4$.

The distance between a number and zero on the number line is called the *absolute value* of the number. Thus 3 and –3 have the same absolute value, 3, since they are both three units from zero. The absolute value of 3 is denoted $|3|$. Examples of absolute values of numbers are

$$|-5| = |5| = 5, \left|-\frac{7}{2}\right| = \frac{7}{2}, \text{ and } |0| = 0$$

Note that the absolute value of any nonzero number is positive.

Here are some properties of real numbers that are used frequently. If x, y, and z are real numbers, then

(1) $x + y = y + x$ and $xy = yx$.
For example, $8 + 3 = 3 + 8 = 11$, and $(17)(5) = (5)(17) = 85$.

(2) $(x + y) + z = x + (y + z)$ and $(xy)z = x(yz)$.
For example, $(7 + 5) + 2 = 7 + (5 + 2) = 7 + (7) = 14$, and $\left(5\sqrt{3}\right)\left(\sqrt{3}\right) = \left(5\sqrt{3}\ \sqrt{3}\right) = (5)(3) = 15$.

(3) $x(y + z) = xy + xz$.
For example, $718(36) + 718(64) = 718(36 + 64) = 718(100) = 71{,}800$.

(4) If x and y are both positive, then $x + y$ and xy are positive.

(5) If x and y are both negative, then $x + y$ is negative and xy is positive.

(6) If x is positive and y is negative, then xy is negative.

(7) If $xy = 0$, then $x = 0$ or $y = 0$. For example, $3y = 0$ implies $y = 0$.

(8) $|x + y| \le |x| + |y|$. For example, if $x = 10$ and $y = 2$, then $|x + y| = |12| = 12 = |x| + |y|$; and if $x = 10$ and $y = –2$, then $|x + y| = |8| = 8 < 12 = |x| + |y|$.

5. Ratio and Proportion

The *ratio* of the number a to the number b ($b \neq 0$) is $\frac{a}{b}$.

A ratio may be expressed or represented in several ways. For example, the ratio of 2 to 3 can be written as 2 to 3, 2:3, or $\frac{2}{3}$. The order of the terms of a ratio is important. For example, the ratio of the number of months with exactly 30 days to the number with exactly 31 days is $\frac{4}{7}$, not $\frac{7}{4}$.

A *proportion* is a statement that two ratios are equal; for example, $\frac{2}{3} = \frac{8}{12}$ is a proportion. One way to solve a proportion involving an unknown is to cross multiply, obtaining a new equality. For example, to solve for n in the proportion $\frac{2}{3} = \frac{n}{12}$, cross multiply, obtaining $24 = 3n$; then divide both sides by 3, to get $n = 8$.

6. Percents

Percent means *per hundred* or *number out of 100*. A percent can be represented as a fraction with a denominator of 100, or as a decimal. For example, $37\% = \frac{37}{100} = 0.37$.

To find a certain percent of a number, multiply the number by the percent expressed as a decimal or fraction. For example:

$$20\% \text{ of } 90 = 0.2 \times 90 = 18$$

or

$$20\% \text{ of } 90 = \frac{20}{100} \times 90 = \frac{1}{5} \times 90 = 18.$$

Percents greater than 100%.

Percents greater than 100% are represented by numbers greater than 1. For example:

$$300\% = \frac{300}{100} = 3$$

$$250\% \text{ of } 80 = 2.5 \times 80 = 200.$$

Percents less than 1%.

The percent 0.5 % means $\frac{1}{2}$ of 1 percent. For example, 0.5 % of 12 is equal to $0.005 \times 12 = 0.06$.

Percent change.

Often a problem will ask for the percent increase or decrease from one quantity to another quantity. For example, "If the price of an item increases from \$24 to \$30, what is the percent increase in price?" To find the percent increase, first find the amount of the increase; then divide this increase by the original amount, and express this quotient as a percent. In the example above, the percent increase would be found in the following way: the amount of the increase is $(30 – 24) = 6$. Therefore, the percent increase is $\frac{6}{24} = 0.25 = 25\%$.

40. If n is an integer, which of the following must be even?

(A) $n + 1$
(B) $n + 2$
(C) $2n$
(D) $2n + 1$
(E) n^2

41. If 4 is one solution of the equation $x^2 + 3x + k = 10$, where k is a constant, what is the other solution?

(A) –7
(B) –4
(C) –3
(D) 1
(E) 6

42. If $\begin{vmatrix} a & b \\ c & d \end{vmatrix} = ad - bc$ for all numbers a, b, c, and d, then $\begin{vmatrix} 3 & 5 \\ -2 & 4 \end{vmatrix} =$

(A) –22
(B) –2
(C) 2
(D) 7
(E) 22

43. The sum $\frac{7}{8} + \frac{1}{9}$ is between

(A) $\frac{1}{2}$ and $\frac{3}{4}$
(B) $\frac{3}{4}$ and 1
(C) 1 and $1\frac{1}{4}$
(D) $1\frac{1}{4}$ and $1\frac{1}{2}$
(E) $1\frac{1}{2}$ and 2

44. If $x = 1 - 3t$ and $y = 2t - 1$, then for what value of t does $x = y$?

(A) $\frac{5}{2}$
(B) $\frac{3}{2}$
(C) $\frac{2}{3}$
(D) $\frac{2}{5}$
(E) 0

45. $1 - \left(\frac{1}{2} - \frac{2}{3}\right) =$

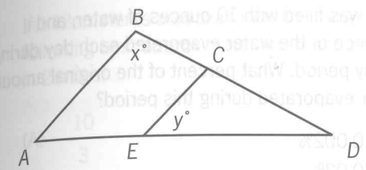
(A) $\frac{6}{5}$
(B) $\frac{7}{6}$
(C) $\frac{6}{7}$
(D) $\frac{5}{6}$
(E) 0

46. $\frac{(0.3)^5}{(0.3)^3} =$

(A) 0.001
(B) 0.01
(C) 0.09
(D) 0.9
(E) 1.0

47. In a horticultural experiment, 200 seeds were planted in plot I and 300 were planted in plot II. If 57 percent of the seeds in plot I germinated and 42 percent of the seeds in plot II germinated, what percent of the total number of planted seeds germinated?

(A) 45.5%
(B) 46.5%
(C) 48.0%
(D) 49.5%
(E) 51.0%



Note: Figure not drawn to scale.

48. In the figure above, if $\overline{AB} \parallel \overline{CE}$, $CE = DE$, and $y = 45$, then $x =$

(A) 45
(B) 60
(C) 67.5
(D) 112.5
(E) 135

49. How many integers n are there such that $1 < 5n + 5 < 25$?

(A) Five
(B) Four
(C) Three
(D) Two
(E) One

50. If y is an integer, then the least possible value of $|23 - 5y|$ is

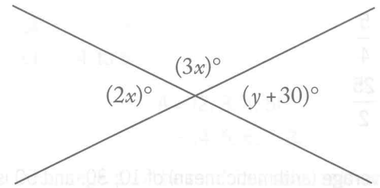
(A) 1
(B) 2
(C) 3
(D) 4
(E) 5

51. $\left(\sqrt{7} + \sqrt{7}\right)^2 =$

(A) 98
(B) 49
(C) 28
(D) 21
(E) 14

52. In a certain population, there are 3 times as many people aged 21 or under as there are people over 21. The ratio of those 21 or under to the total population is

(A) 1 to 2
(B) 1 to 3
(C) 1 to 4
(D) 2 to 3
(E) 3 to 4



53. In the figure above, the value of y is

(A) 6
(B) 12
(C) 24
(D) 36
(E) 42

54. $\sqrt{80} + \sqrt{125} =$

(A) $9\sqrt{5}$
(B) $20\sqrt{5}$
(C) $41\sqrt{5}$
(D) $\sqrt{205}$
(E) 100

55. Kelly and Chris packed several boxes with books. If Chris packed 60 percent of the total number of boxes, what was the ratio of the number of boxes Kelly packed to the number of boxes Chris packed?

(A) 1 to 6
(B) 1 to 4
(C) 2 to 5
(D) 3 to 5
(E) 2 to 3

$$\frac{20 + 40 + x}{3} = 25$$

$$\frac{60 + x}{3} = 25 \quad \text{simplify}$$

$$60 + x = 75 \quad \text{multiply both sides by 3}$$

$$x = 15 \quad \text{subtract 60 from both sides}$$

The correct answer is A.

$$y = kx + 3$$

58. In the equation above, k is a constant. If $y = 17$ when $x = 2$, what is the value of y when $x = 4$?

(A) 34
(B) 31
(C) 14
(D) 11
(E) 7

Algebra First-degree equations

If $y = kx + 3$ and $y = 17$ when $x = 2$, then

$17 = 2k + 3$

$14 = 2k$

$7 = k$

Therefore, $y = 7x + 3$. When $x = 4$, $y = 7(4) + 3 = 31$.

The correct answer is B.

59. Each week, Harry is paid x dollars per hour for the first 30 hours and 1.5x dollars for each additional hour worked that week. Each week, James is paid x dollars per hour for the first 40 hours and 2x dollars for each additional hour worked that week. Last week James worked a total of 41 hours. If Harry and James were paid the same amount last week, how many hours did Harry work last week?

(A) 35
(B) 36
(C) 37
(D) 38
(E) 39

Algebra Systems of equations

Harry's pay, H, is given by

$$H = \begin{cases} xh \text{ for } h \le 30 \\ 30x + 1.5x(h - 30) \text{ for } h > 30 \end{cases}$$

and James's pay, J, is given by

$$J = \begin{cases} xh \text{ for } h \le 40 \\ 40x + 2x(h - 40) \text{ for } h > 40 \end{cases}$$

James worked 41 hours, for which his pay was $40x + 2x(41 - 40) = 42x$. Harry was paid the same amount as James, so Harry's pay was also $42x$. Thus,

$42x = 30x + 1.5x(h - 30)$

$12x = 1.5x(h - 30)$

$8 = h - 30$

$38 = h$

The correct answer is D.

60. A glass was filled with 10 ounces of water, and 0.01 ounce of the water evaporated each day during a 20-day period. What percent of the original amount of water evaporated during this period?

(A) 0.002%
(B) 0.02%
(C) 0.2%
(D) 2%
(E) 20%

Arithmetic Percents

Since 0.01 ounce of water evaporated each day for 20 days, a total of $20(0.01) = 0.2$ ounce evaporated. Then, to find the percent of the original amount of water that evaporated, divide the amount that evaporated by the original amount and multiply by 100 to convert the decimal to a percent. Thus, $\frac{0.2}{10} \times 100 = 0.02 \times 100$ or 2%.

The correct answer is D.

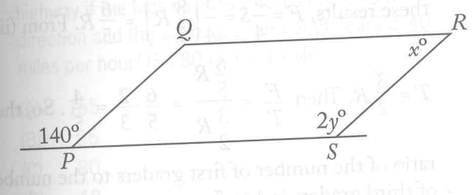
61. A glucose solution contains 15 grams of glucose per 100 cubic centimeters of solution. If 45 cubic centimeters of the solution were poured into an empty container, how many grams of glucose would be in the container?

(A) 3.00
(B) 5.00
(C) 5.50
(D) 6.50
(E) 6.75

Algebra Applied problems

Let x be the number of grams of glucose in the 45 cubic centimeters of solution. The proportion comparing the glucose in the 45 cubic centimeters to the given information about the 15 grams of glucose in the entire 100 cubic centimeters of solution can be expressed as $\frac{x}{45} = \frac{15}{100}$, and thus $100x = 675$ or $x = 6.75$.

The correct answer is E.



62. In the figure above, if $PQRS$ is a parallelogram, then $y - x =$

(A) 30
(B) 35
(C) 40
(D) 70
(E) 100

Geometry Polygons

Since $PQRS$ is a parallelogram, the following must be true:

$140 = 2y$ corresponding angles are congruent

$2y + x = 180$ consecutive angles are supplementary (sum = 180°)

Solving the first equation for y gives $y = 70$. Substituting this into the second equation gives

$2(70) + x = 180$

$140 + x = 180$

$x = 40$

Thus, $y - x = 70 - 40 = 30$.

The correct answer is A.

63. If 1 kilometer is approximately 0.6 mile, which of the following best approximates the number of kilometers in 2 miles?

(A) $\frac{10}{3}$
(B) 3
(C) $\frac{6}{5}$
(D) $\frac{1}{3}$
(E) $\frac{3}{10}$

Arithmetic Applied problems

Since 1 km ≈ 0.6 mi = $\frac{3}{5}$ mi, divide to find that $\left(1 \div \frac{3}{5}\right)$ km ≈ 1 mi, or $\frac{5}{3}$ km ≈ 1 mi. Therefore, $2\left(\frac{5}{3}\right)$ km ≈ 2 mi, or $\frac{10}{3}$ km ≈ 2 mi.

The correct answer is A.

64. Lucy invested $10,000 in a new mutual fund account exactly three years ago. The value of the account increased by 10 percent during the first year, increased by 5 percent during the second year, and decreased by 10 percent during the third year. What is the value of the account today?

(A) $10,350
(B) $10,395
(C) $10,500
(D) $11,500
(E) $12,705

216. $\left(\frac{1}{2}\right)^{-3}\left(\frac{1}{4}\right)^{-2}\left(\frac{1}{16}\right)^{-1} =$

(A) $\left(\frac{1}{2}\right)^{-48}$

(B) $\left(\frac{1}{2}\right)^{-11}$

(C) $\left(\frac{1}{2}\right)^{-6}$

(D) $\left(\frac{1}{8}\right)^{-11}$

(E) $\left(\frac{1}{8}\right)^{-6}$

Arithmetic Operations on rational numbers

It is clear from the answer choices that all three factors need to be written with a common denominator, and they thus become

$\left(\frac{1}{2}\right)^{-3} = \left(\frac{1}{2}\right)^{-3}$

$\left(\frac{1}{4}\right)^{-2} = \left(\left(\frac{1}{2}\right)^{2}\right)^{-2} = \left(\frac{1}{2}\right)^{-4}$

$\left(\frac{1}{16}\right)^{-1} = \left(\left(\frac{1}{2}\right)^{4}\right)^{-1} = \left(\frac{1}{2}\right)^{-4}$

So, $\left(\frac{1}{2}\right)^{-3}\left(\frac{1}{4}\right)^{-2}\left(\frac{1}{16}\right)^{-1} =$

$\left(\frac{1}{2}\right)^{-3}\left(\frac{1}{2}\right)^{-4}\left(\frac{1}{2}\right)^{-4} = \left(\frac{1}{2}\right)^{-3-4-4} = \left(\frac{1}{2}\right)^{-11}$.

The correct answer is B.

217. In a certain game, a large container is filled with red, yellow, green, and blue beads worth, respectively, 7, 5, 3, and 2 points each. A number of beads are then removed from the container. If the product of the point values of the removed beads is 147,000, how many red beads were removed?

(A) 5
(B) 4
(C) 3
(D) 2
(E) 0

Arithmetic Properties of numbers

From this, the red beads represent factors of 7 in the total point value of 147,000. Since 147,000 = 147(1,000), and $1{,}000 = 10^3$, then 147 is all that needs to be factored to determine the factors of 7. Factoring 147 yields $147 = (3)(49) = (3)(7^2)$. This means there are 2 factors of 7, or 2 red beads.

The correct answer is D.

218. If $\frac{2}{1+\frac{2}{y}} = 1$, then $y =$

(A) -2

(B) $-\frac{1}{2}$

(C) $\frac{1}{2}$

(D) 2

(E) 3

Algebra First-degree equations

Solve for y.

$\frac{2}{1+\frac{2}{y}} = 1$

$1+\frac{2}{y} = 2$ multiply both sides by $1+\frac{2}{y}$

$\frac{2}{y} = 1$ subtract 1 from each side

$y = 2$ solve for y

The correct answer is D.

219. If a, b, and c are consecutive positive integers and $a < b < c$, which of the following must be true?

I. $c - a = 2$

II. abc is an even integer.

III. $\frac{a+b+c}{3}$ is an integer.

(A) I only
(B) II only
(C) I and II only
(D) II and III only
(E) I, II, and III

Arithmetic Properties of numbers

Since a, b, and c are consecutive positive integers and $a < b < c$, then $b = a + 1$ and $c = a + 2$.

I. $c - a = (a + 2) - a = 2$ MUST be true

II. (odd)(even)(odd) = even MUST be true

(even)(odd)(even) = even MUST be true

III. $\frac{a+b+c}{3} = \frac{a+(a+1)+(a+2)}{3}$

$= \frac{3a+3}{3} = a + 1 = b$

b is an integer MUST be true

The correct answer is E.

220. A part-time employee whose hourly wage was increased by 25 percent decided to reduce the number of hours worked per week so that the employee's total weekly income would remain unchanged. By what percent should the number of hours worked be reduced?

(A) 12.5%
(B) 20%
(C) 25%
(D) 50%
(E) 75%

Algebra Applied problems

Let w represent the original hourly wage. Letting h be the original number of hours the employee worked per week, the original weekly income can be expressed as wh. Given a 25% increase in hourly wage, the employee's new wage is thus $1.25w$. Letting H be the reduced number of hours, the problem can then be expressed as:

$1.25wH = wh$ (new wage)(new hours) = (original wage)(original hours)

By dividing both sides by w, this equation can be solved for H:

$1.25H = h$

$H = 0.8h$

Since the new hours should be 0.8 = 80% of the original hours, the number of hours worked should be reduced by 20 percent.

The correct answer is B.

221. Of the 200 students at College T majoring in one or more of the sciences, 130 are majoring in chemistry and 150 are majoring in biology. If at least 30 of the students are not majoring in either chemistry or biology, then the number of students majoring in *both* chemistry and biology could be any number from

(A) 20 to 50
(B) 40 to 70
(C) 50 to 130
(D) 110 to 130
(E) 110 to 150

Arithmetic Operations on rational numbers

A Venn diagram will help with this problem. There are two extremes that need to be considered: (1) having the least number of students majoring in both chemistry and biology and (2) having the greatest number of students majoring in both chemistry and biology.

(1) If at least 30 science majors are not majoring in either chemistry or biology, then at most 200 – 30 = 170 students can be majoring in either or both. Since there are 130 + 150 = 280 biology and chemistry majors (some of whom are individual students majoring in both areas), then there are at least 280 – 170 = 110 majoring in both. The diagram following shows this relationship.

Line Current feminist theory, in validating women's own stories of their experience, has encouraged scholars of women's history to view the use of women's oral narratives as the methodology, next to the use of women's written autobiography, that brings historians closest to the "reality" of women's lives. Such narratives, unlike most standard histories, represent experience from the perspective of women, affirm the importance of women's contributions, and furnish present-day women with historical continuity that is essential to their identity, individually and collectively.

Scholars of women's history should, however, be as cautious about accepting oral narratives at face value as they already are about written memories. Oral narratives are no more likely than are written narratives to provide a disinterested commentary on events or people. Moreover, the stories people tell to explain themselves are shaped by narrative devices and storytelling conventions, as well as by other cultural and historical factors, in ways that the storytellers may be unaware of. The political rhetoric of a particular era, for example, may influence women's interpretations of the significance of their experience. Thus a woman who views the Second World War as pivotal in increasing the social acceptance of women's paid work outside the home may reach that conclusion partly and unwittingly because of wartime rhetoric encouraging a positive view of women's participation in such work.

Questions 36–41 refer to the passage above.

36. The passage is primarily concerned with

(A) contrasting the benefits of one methodology with the benefits of another

(B) describing the historical origins and inherent drawbacks of a particular methodology

(C) discussing the appeal of a particular methodology and some concerns about its use

(D) showing that some historians' adoption of a particular methodology has led to criticism of recent historical scholarship

(E) analyzing the influence of current feminist views on women's interpretations of their experience

37. According to the passage, which of the following shapes the oral narratives of women storytellers?

(A) The conventions for standard histories in the culture in which a woman storyteller lives

(B) The conventions of storytelling in the culture in which a woman storyteller lives

(C) A woman storyteller's experience with distinctive traditions of storytelling developed by the women in her family of origin

(D) The cultural expectations and experiences of those who listen to oral narratives

(E) A woman storyteller's familiarity with the stories that members of other groups in her culture tell to explain themselves

38. The author of the passage would be most likely to make which of the following recommendations to scholars of women's history?

(A) They should take into account their own life experiences when interpreting the oral accounts of women's historical experiences.

(B) They should assume that the observations made in women's oral narratives are believed by the intended audience of the story.

(C) They should treat skeptically observations reported in oral narratives unless the observations can be confirmed in standard histories.

(D) They should consider the cultural and historical context in which an oral narrative was created before arriving at an interpretation of such a narrative.

(E) They should rely on information gathered from oral narratives only when equivalent information is not available in standard histories.

39. Which of the following best describes the function of the last sentence of the passage?

(A) It describes an event that historians view as crucial in recent women's history.

(B) It provides an example of how political rhetoric may influence the interpretations of experience reported in women's oral narratives.

(C) It provides an example of an oral narrative that inaccurately describes women's experience during a particular historical period.

(D) It illustrates the point that some women are more aware than others of the social forces that shape their oral narratives.

(E) It identifies the historical conditions that led to the social acceptance of women's paid work outside the home.

40. According to the passage, scholars of women's history should refrain from doing which of the following?

(A) Relying on traditional historical sources when women's oral narratives are unavailable

(B) Focusing on the influence of political rhetoric on women's perceptions to the exclusion of other equally important factors

(C) Attempting to discover the cultural and historical factors that influence the stories women tell

(D) Assuming that the conventions of women's written autobiographies are similar to the conventions of women's oral narratives

(E) Accepting women's oral narratives less critically than they accept women's written histories

41. According to the passage, each of the following is a difference between women's oral narratives and most standard histories EXCEPT:

(A) Women's oral histories validate the significance of women's achievements.

(B) Women's oral histories depict experience from the point of view of women.

(C) Women's oral histories acknowledge the influence of well-known women.

(D) Women's oral histories present today's women with a sense of their historical relationship to women of the past.

(E) Women's oral histories are crucial to the collective identity of today's women.

34. The author of the passage mentions which of the following as one disadvantage of the United States government's definition of services?

(A) It is less useful than the other definitions mentioned in the passage.
(B) It is narrower in scope than the other definitions mentioned in the passage.
(C) It is based on the final product produced rather than on the type of work performed.
(D) It does not recognize the diversity of occupations within the service industries.
(E) It misclassifies many workers who are employed in service industries.

Supporting ideas

This question is based on specific information explicitly stated in the passage. According to the author, the government's definition fails because *it categorizes workers based on their company's final product rather than on the actual work the employees perform* (lines 20–22).

A The author calls this definition *practical for government purposes*, so for the government it is more useful than other definitions.
B The definition *includes everything that is not agriculture or industry,* while the classical definition does not include occupations that are clearly services; the government's definition is thus not narrower.
C **Correct.** Workers are categorized by the final product of their company rather than by the type of work they perform at that company.
D Diversity of occupations within the service industries is not discussed.
E The definition misclassifies service workers employed in manufacturing, not service industries.

The correct answer is C.

35. The author refers to "service workers employed by manufacturers" (line 23) primarily in order to point out

(A) a type of worker not covered by the United States government's system of classifying occupations
(B) a flaw in the United States government's definition of services
(C) a factor that has influenced the growth of the service economy in the United States
(D) a type of worker who is classified on the basis of work performed rather than on the basis of the company's final product
(E) the diversity of the workers who are referred to as service workers

Logical structure

The author discusses *the many service workers employed by manufacturers* to illustrate the failure of the government's definition to distinguish between service industries and service occupations. The resulting ambiguities, in the author's view, reveal the *arbitrariness* of the definition and its inaccuracy in reflecting the composition of the economy.

A The worker is covered but misclassified.
B **Correct.** The author uses this example to point out a serious shortcoming in the government's definition.
C The author mentions the growth of services at the beginning of the passage but does not explore the reasons for it.
D The situation of service workers employed by manufacturers is just the reverse; they are categorized by the company's final product, not by the work they do.
E The author had earlier cited and illustrated the diversity of service activities that are included in the government's residual category of services; the focus here is instead the arbitrariness and inaccuracy, in the author's view, of the government's definition.

The correct answer is B.

Questions 36–41 refer to the passage on page 374.

36. The passage is primarily concerned with

(A) contrasting the benefits of one methodology with the benefits of another
(B) describing the historical origins and inherent drawbacks of a particular methodology
(C) discussing the appeal of a particular methodology and some concerns about its use
(D) showing that some historians' adoption of a particular methodology has led to criticism of recent historical scholarship
(E) analyzing the influence of current feminist views on women's interpretations of their experience

Main idea

This question asks for an abstract view of what the passage as a whole is primarily doing. The passage introduces a particular methodology that scholars of women's history have been encouraged to employ, explaining why the use of the methodology is supported. The passage then goes on to raise some concerns about the use of the methodology and cites one example in which caution is needed.

A The passage is primarily concerned with only one methodology.
B The passage mentions why the methodology had been encouraged but does not give the history of its origins; while it cautions historians to employ the methodology carefully, it is not concerned with drawbacks of its proper use.
C **Correct.** The passage discusses why the use of a methodology is being encouraged and then offers some concerns about its use.
D The passage does not discuss any criticism of recent scholarship in women's history.
E There is no mention in the passage that feminist theory is influencing how women in general think about their experiences.

The correct answer is C.

37. According to the passage, which of the following shapes the oral narratives of women storytellers?

(A) The conventions for standard histories in the culture in which a woman storyteller lives
(B) The conventions of storytelling in the culture in which a woman storyteller lives
(C) A woman storyteller's experience with distinctive traditions of storytelling developed by the women in her family of origin
(D) The cultural expectations and experiences of those who listen to oral narratives
(E) A woman storyteller's familiarity with the stories that members of other groups in her culture tell to explain themselves

Supporting ideas

This question asks for an identification of specific information provided by the passage. In the second paragraph, the passage describes certain concerns about using oral narratives. One of these concerns is that *the stories people tell to explain themselves are shaped by ... storytelling conventions* (lines 17–19) and other influences tied to the teller's cultural and historical context.

A The passage uses *standard histories* (line 7) to refer to the usual work of scholars and not to something that influences oral narratives.
B **Correct.** The passage raises as a concern that oral narratives may be influenced by storytelling conventions present in the culture of the speaker.
C The passage does not mention the family of origin of women storytellers.
D The passage does not mention the expectations of the listeners of oral narratives.
E The passage does not discuss women storytellers' familiarity with the oral narratives belonging to other groups of women.

The correct answer is B.

Application

Finding an example involves applying the information in the passage to new situations. How do managers reach *an "Aha!" experience*? Lines 28–29 clearly explain that this experience is the result of the managers' ability *to synthesize isolated bits of data and practice into an integrated picture*. Managers connect apparently unrelated pieces of information and elements of their previous experience, and, through these unexpected connections, produce a unified picture or pattern.

A This managerial style is mentioned in the last paragraph, but not as defining the *"Aha!" experience*.
B Lines 23–27 indicate that managers use intuition *to perform well-learned behavior patterns rapidly*, but the result is not an *"Aha!" experience*.
C **Correct.** Through an intuitive appreciation of the subtle interrelationships of disparate facts and experiences, the manager all at once perceives the coherent overarching pattern or picture formed by the interconnections, which lines 28–29 define as an *"Aha!" experience*.
D Lines 34–38 show that managers do possess this ability, but it does not culminate in an *"Aha!" experience*.
E This managerial style is also related to the second function of intuition, *to perform well-learned behavior patterns rapidly* (lines 23–27), but does not define an *"Aha!" experience*.

The correct answer is C.

100. According to the passage, the classical model of decision analysis includes all of the following EXCEPT

(A) evaluation of a problem
(B) creation of possible solutions to a problem
(C) establishment of clear goals to be reached by the decision
(D) action undertaken in order to discover more information about a problem
(E) comparison of the probable effects of different solutions to a problem

Supporting ideas

What does the passage say about the classical model of decision analysis? The first sentence defines the classical model as *clarifying goals, assessing the problem, formulating options, estimating likelihoods of success, making a decision, and only then taking action to implement the decision*. To solve this process-of-elimination question, check the given list against the possible answers in order to find the one that does not match. Note that the exact wording in the answers may differ from that in the passage; the match is based on underlying meaning.

A Evaluating a problem is identified as *assessing the problem*.
B Creating solutions is identified as *formulating options*.
C Establishing goals is identified as *clarifying goals*.
D **Correct.** Acting in order to learn more about the problem is not identified in the passage as part of the rational classical model. It does appear as part of the acting/thinking cycle in the last paragraph.
E Comparing probable effects is identified as *estimating likelihoods of success*.

The correct answer is D.

101. It can be inferred from the passage that which of the following would most probably be one major difference in behavior between Manager X, who uses intuition to reach decisions, and Manager Y, who uses only formal decision analysis?

(A) Manager X analyzes first and then acts; Manager Y does not.
(B) Manager X checks possible solutions to a problem by systematic analysis; Manager Y does not.
(C) Manager X takes action in order to arrive at the solution to a problem; Manager Y does not.
(D) Manager Y draws on years of hands-on experience in creating a solution to a problem; Manager X does not.
(E) Manager Y depends on day-to-day tactical maneuvering; Manager X does not.

Application

To answer this question, apply the information in the passage to the specific examples of Manager X, an intuitive decision maker, and Manager Y, who relies exclusively on formal decision analysis. The first paragraph distinguishes between the process of formal decision analysis, in which a decision is made and then action is taken (lines 4–5), and the process of intuition, in which action is integrated into the process of thinking (lines 10–11). The last paragraph reinforces the definition of the intuitive manager as one for whom *"thinking" is inseparable from acting* and *action is often part of defining the problem*. Manager X is likely to act as part of the process of solving a problem, but Manager Y is not.

A Acting only after analysis characterizes the rational model, not intuition.
B Systematic analysis is typical of the rational model, not intuition.
C **Correct.** An intuitive manager acts as a step within the problem-solving process, but a manager who depends on formal decision analysis acts only after making a decision.
D Drawing on experience is linked in the passage with intuition rather than with rational analysis; the passage does not suggest that managers who use formal decision analysis would ignore their experience in so doing.
E Day-to-day tactical maneuvers are required of all managers.

The correct answer is C.

102. The passage provides support for which of the following statements?

(A) Managers who rely on intuition are more successful than those who rely on formal decision analysis.
(B) Managers cannot justify their intuitive decisions.
(C) Managers' intuition works contrary to their rational and analytical skills.
(D) Logical analysis of a problem increases the number of possible solutions.
(E) Intuition enables managers to employ their practical experience more efficiently.

Logical structure

This question asks the reader to select the statement for which there is the most justification in the passage. The entire passage places value on the use of intuition, so the answer to this question is bound to show a benefit of intuition. Lines 25–27 reveal that intuition is based on *years of painstaking practice and hands-on experience* and lines 38–40 explain that, in contrast to formal decision analysis, intuition allows managers to *move rapidly to engender a plausible solution*. Thus, intuition enables managers to apply their experience quickly and productively, that is, efficiently.

A The first paragraph acknowledges that most successful managers are intuitive, but it does not go so far as to make this comparison.
B There is no support for or against this statement in the passage; Isenberg's research shows why intuition is beneficial, but does not address how managers justify their decisions.
C Intuition does not compete with rational analysis, but complements it; line 25 provides an assurance that intuition is *not arbitrary or irrational*.
D The passage does not support this claim for logical analysis.
E **Correct.** Managers can reach decisions more efficiently through an intuitive approach based on experience than through time-consuming formal analyses.

The correct answer is E.

Questions 103–107 refer to the passage on page 396.

103. The passage is primarily concerned with

(A) identifying two practices in medical research that may affect the accuracy of clinical trials
(B) describing aspects of medical research that tend to drive up costs
(C) evaluating an analysis of certain shortcomings of current medical research practices
(D) describing proposed changes to the ways in which clinical trials are conducted
(E) explaining how medical researchers have traditionally conducted clinical trials and how such trials are likely to change

11. Wood smoke contains dangerous toxins that cause changes in human cells. Because wood smoke presents such a high health risk, legislation is needed to regulate the use of open-air fires and wood-burning stoves.

Which of the following, if true, provides the most support for the argument above?

(A) The amount of dangerous toxins contained in wood smoke is much less than the amount contained in an equal volume of automobile exhaust.

(B) Within the jurisdiction covered by the proposed legislation, most heating and cooking is done with oil or natural gas.

(C) Smoke produced by coal-burning stoves is significantly more toxic than smoke from wood-burning stoves.

(D) No significant beneficial effect on air quality would result if open-air fires were banned within the jurisdiction covered by the proposed legislation.

(E) In valleys where wood is used as the primary heating fuel, the concentration of smoke results in poor air quality.

Argument Construction

Situation Wood smoke is hazardous, so restrictive legislation is needed.

Reasoning *Which point supports the need for legislation?* The argument for legislation is based on the position that wood smoke is hazardous to people's health. Any evidence of physical harm resulting from wood smoke supports the argument that legislation is needed. Undoubtedly, poor air quality caused by a high concentration of wood smoke presents just such a health risk.

A If wood smoke were as dangerous as car exhaust, this might support the idea of regulating it just as exhaust emissions are regulated; but this statement tells us it is less dangerous.

B This point suggests less of a need for legislation.

C This information provides no support for the idea that the use of wood-burning stoves should be regulated.

D The lack of benefit from banning open-air fires is a point against the legislation.

E **Correct.** This supports the argument in favor of legislation.

The correct answer is E.

12. A certain automaker aims to increase its market share by deeply discounting its vehicles' prices for the next several months. The discounts will cut into profits, but because they will be heavily advertised the manufacturer hopes that they will attract buyers away from rival manufacturers' cars. In the longer term, the automaker envisions that customers initially attracted by the discounts may become loyal customers.

In assessing the plan's chances of achieving its aim, it would be most useful to know which of the following?

(A) Whether the automaker's competitors are likely to respond by offering deep discounts on their own products

(B) Whether the advertisements will be created by the manufacturer's current advertising agency

(C) Whether some of the automaker's models will be more deeply discounted than others

(D) Whether the automaker will be able to cut costs sufficiently to maintain profit margins even when the discounts are in effect

(E) Whether an alternative strategy might enable the automaker to enhance its profitability while holding a constant or diminishing share of the market

Evaluation of a Plan

Situation An automaker is planning to offer deep discounts on its vehicles' prices in order to increase its market share. The automaker's profit margins will be reduced by this action. By advertising the discounts, the automaker hopes to attract customers who might otherwise be inclined to buy rival manufacturers' cars. These customers would ideally then develop loyalty to the automaker's cars.

Reasoning *What would it be most useful to know in assessing whether offering deep discounts will enable the automaker to increase its market share?* To achieve an increase in market share, the automaker would have to take customers away from other automakers. Under what circumstances would other automakers be able to retain their customers, if those customers are more likely to purchase cars from automakers that offer deep discounts (and then remain loyal to those automakers)? The other automakers might try to retain their customers by matching the discounts. Thus it would be useful to know whether the other automakers would indeed offer such discounts.

A **Correct.** If the answer to this question were yes, the plan would probably not achieve its aim of increasing market share. If the answer were no, the plan would have a good chance of succeeding.

B Since there is no information about the effectiveness of the automaker's current advertising, it would not be useful to know whether the same advertising agency will produce the ads publicizing the discount.

C Knowing whether some models will be more deeply discounted than others might help in assessing which of the automaker's models will sell best, but it would not help in assessing the overall chance of the automaker increasing its market share.

D The discounts the automaker plans to offer will cut into profits, according to the information given, so the question of whether the automaker can maintain profit margins while the discounts are in effect has already been answered.

E While it might be useful to the automaker to know about alternative strategies, such knowledge does not help in assessing the likelihood that the plan under discussion will achieve its aim.

The correct answer is A.