

The Graduate Record  
Examinations®  
SECTION 1  
**Analytical Writing**

**ANALYZE AN ISSUE**

30 minutes

You will be given a brief quotation that states or implies an issue of general interest and specific instructions on how to respond to that issue. You will then have 30 minutes to plan and compose a response according to the specific instructions. A response to any other issue will receive a score of zero.

Make sure that you respond according to the specific instructions and support your position on the issue with reasons and examples drawn from such areas as your reading, experience, observations, and/or academic studies.

Trained GRE readers will evaluate your response for its overall quality, based on how well you:

- Respond to the specific task instructions
- Consider the complexities of the issue
- Organize, develop, and express your ideas
- Support your ideas with relevant reasons and/or examples
- Control the elements of standard written English

Before you begin writing, you may want to think for a few minutes about the issue and the specific task instructions and then plan your response. Be sure to develop your position fully and organize it coherently, but leave time to reread what you have written and make any revisions you think are necessary.

**Issue Topic**

The best way to teach is to praise positive actions and ignore negative ones.

Write a response in which you discuss the extent to which you agree or disagree with the recommendation and explain your reasoning for the position you take. In developing and supporting your position, describe specific circumstances in which adopting the recommendation would or would not be advantageous and explain how these examples shape your position.

The Graduate Record  
Examinations®  
SECTION 2  
**Analytical Writing**

**ANALYZE AN ARGUMENT**

30 minutes

You will be given a short passage that presents an argument and specific instructions on how to respond to that passage. You will then have 30 minutes to plan and compose a response in which you evaluate the passage according to the specific instructions. A response to any other argument will receive a score of zero.

**Note that you are NOT being asked to present your own views on the subject.** Make sure that you respond according to the specific instructions and support your evaluation with relevant reasons and/or examples.

Trained GRE readers will evaluate your response for its overall quality, based on how well you:

- Respond to the specific task instructions
- Identify and analyze features of the argument relevant to the assigned task
- Organize, develop, and express your ideas
- Support your analysis with relevant reasons and/or examples
- Control the elements of standard written English

Before you begin writing, you may want to think a few minutes about the argument passage and the specific task instructions and then plan your response. Be sure to develop your response fully and organize it coherently, but leave time to reread what you have written and make any revisions that you think are necessary.

## Argument Topic

The following appeared in an article written by Dr. Karp, an anthropologist.

“Twenty years ago, Dr. Field, a noted anthropologist, visited the island of Tertia and concluded from his observations that children in Tertia were reared by an entire village rather than by their own biological parents. However, my recent interviews with children living in the group of islands that includes Tertia show that these children spend much more time talking about their biological parents than about other adults in the village. This research of mine proves that Dr. Field's conclusion about Tertian village culture is invalid and thus that the observation-centered approach to studying cultures is invalid as well. The interview-centered method that my team of graduate students is currently using in Tertia will establish a much more accurate understanding of child-rearing traditions there and in other island cultures.”

Write a response in which you discuss what specific evidence is needed to evaluate the argument and explain how the evidence would weaken or strengthen the argument.

**NO TEST MATERIAL ON THIS PAGE**

**SECTION 3**  
**Verbal Reasoning**  
**Time—35 minutes**  
**25 Questions**

For each of Questions 1 to 4, select one answer choice unless otherwise instructed.

Questions 1 to 3 are based on the following reading passage.

Whether the languages of the ancient American peoples were used for expressing abstract universal concepts can be clearly answered in the case of Nahuatl. Nahuatl, like Greek and German, is a language that allows the formation of extensive compounds. By the combination of radicals or semantic elements, single compound words  
 line 5 can express complex conceptual relations, often of an abstract universal character.

The *tlamatinime* (those who know) were able to use this rich stock of abstract terms to express the nuances of their thought. They also availed themselves of other forms of expression with metaphorical meaning, some probably original, some derived from Toltec coinages. Of these forms, the most characteristic in Nahuatl is the juxtaposition  
 10 of two words that, because they are synonyms, associated terms, or even contraries, complement each other to evoke one single idea. Used metaphorically, the juxtaposed terms connote specific or essential traits of the being they refer to, introducing a mode of poetry as an almost habitual form of expression.

**For the following question, consider each of the choices separately and select all that apply.**

1. Which of the following can be inferred from the passage regarding present-day research relating to Nahuatl?
  - A Some record or evidence of the thought of the *tlamatinime* is available.
  - B For at least some Nahuatl expressions, researchers are able to trace their derivation from another ancient American language.
  - C Researchers believe that in Nahuatl, abstract universal concepts are always expressed metaphorically.
  
2. Select the sentence in the passage in which the author introduces a specific Nahuatl mode of expression that is not identified as being shared with certain European languages.
  
3. In the context in which it appears, “coinages” (line 9) most nearly means
  - A adaptations
  - B creations
  - C idiosyncrasies
  - D pronunciations
  - E currencies

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**Question 4 is based on the following reading passage.**

At a certain period in Earth's history, its atmosphere contained almost no oxygen, although plants were producing vast quantities of oxygen. As a way of reconciling these two facts, scientists have hypothesized that nearly all of the oxygen being produced was taken up by iron on Earth's surface. Clearly, however, **this explanation is inadequate**. New studies show that **the amount of iron on Earth's surface was not sufficient to absorb anywhere near as much oxygen as was being produced**. Therefore, something in addition to the iron on Earth's surface must have absorbed much of the oxygen produced by plant life.

4. In the argument given, the two portions in **boldface** play which of the following roles?
- (A) The first is a claim made by the argument in support of a certain position; the second is that position.
  - (B) The first is a judgment made by the argument about a certain explanation; the second is that explanation.
  - (C) The first expresses the argument's dismissal of an objection to the position it seeks to establish; the second is that position.
  - (D) The first sums up the argument's position with regard to a certain hypothesis; the second provides grounds for that position.
  - (E) The first is a concession by the argument that its initial formulation of the position it seeks to establish requires modification; the second presents that position in a modified form.

**For Questions 5 to 8, select one entry for each blank from the corresponding column of choices. Fill all blanks in the way that best completes the text.**

5. In her later years, Bertha Pappenheim was an apostle of noble but already (i) \_\_\_\_\_ notions, always respected for her integrity, her energy, and her resolve but increasingly out of step and ultimately (ii) \_\_\_\_\_ even her own organization.

Blank (i)

(A) anachronistic
(B) accepted
(C) exotic

Blank (ii)

(D) emulated by
(E) appreciated by
(F) alienated from

6. The reception given to Kimura's radical theory of molecular evolution shows that when \_\_\_\_\_ fights orthodoxy to a draw, then novelty has seized a good chunk of space from convention.

(A) imitation
(B) reaction
(C) dogmatism
(D) invention
(E) caution

7. The (i)\_\_\_\_\_ of Vladimir Nabokov as one of North America's literary giants has thrown the spotlight on his peripheral activities and has thus served to (ii)\_\_\_\_\_ his efforts as an amateur entomologist.

Blank (i)

(A) stigmatization
(B) lionization
(C) marginalization

Blank (ii)

(D) foreground
(E) transcend
(F) obscure

8. Mathematicians have a distinctive sense of beauty: they strive to present their ideas and results in a clear and compelling fashion, dictated by \_\_\_\_\_ as well as by logic.

(A) caprice
(B) aesthetics
(C) obligation
(D) methodologies
(E) intellect

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For each of Questions 9 to 13, select one answer choice unless otherwise instructed.

Questions 9 to 12 are based on the following reading passage.

Animal signals, such as the complex songs of birds, tend to be costly. A bird, by singing, may forfeit time that could otherwise be spent on other important behaviors such as foraging or resting. Singing may also advertise an individual's location to rivals or predators and impair the ability to detect their approach. Although these types of cost may  
 line 5 be important, discussions of the cost of singing have generally focused on energy costs. Overall the evidence is equivocal: for instance, while Eberhardt found increases in energy consumption during singing for Carolina wrens, Chappell found no effect of crowing on energy consumption in roosters.

To obtain empirical data regarding the energy costs of singing, Thomas examined  
 10 the relationship between song rate and overnight changes in body mass of male nightingales. Birds store energy as subcutaneous fat deposits or "body reserves"; changes in these reserves can be reliably estimated by measuring changes in body mass. If singing has important energy costs, nightingales should lose more body mass on nights when their song rate is high. Thomas found that nightingales reached a sig-  
 15 nificantly higher body mass at dusk and lost more mass overnight on nights when their song rate was high.

These results suggest that there may be several costs of singing at night associated with body reserves. The increased metabolic cost of possessing higher body mass contributes to the increased overnight mass loss. The strategic regulation of evening body  
 20 reserves is also likely to incur additional costs, as nightingales must spend more time foraging in order to build up larger body reserves. The metabolic cost of singing itself may also contribute to increased loss of reserves. This metabolic cost may arise from the muscular and neural activity involved in singing or from behaviors associated with singing. For example, birds may expend more of their reserves on thermoregulation if  
 25 they spend the night exposed to the wind on a song post than if they are in a sheltered roost site. Thomas's data therefore show that whether or not singing per se has an important metabolic cost, metabolic costs associated with singing can have an important measurable effect on a bird's daily energy budget, at least in birds with high song rates such as nightingales.

9. The primary purpose of the passage is to
- (A) compare the different types of cost involved for certain birds in singing
  - (B) question a hypothesis regarding the energy costs of singing for certain birds
  - (C) present evidence suggesting that singing has an important energy cost for certain birds
  - (D) discuss the benefits provided to an organism by a behavior that is costly in energy
  - (E) describe an experiment that supports an alternative model of how birdsong functions

For the following question, consider each of the choices separately and select all that apply.

10. The passage implies that during the day before a night on which a male nightingale's song rate is high, that nightingale probably does which of the following?
- A Expends less of its reserves on thermoregulation than on other days
  - B Stores more energy as body reserves than on other days
  - C Hides to avoid predators
11. Select the sentence in the first or second paragraph that presents empirical results in support of a hypothesis about the energy costs of singing.

For the following question, consider each of the choices separately and select all that apply.

12. It can be inferred from the passage that compared with other costs of singing, which of the following is true of the energy costs of singing?
- A They are the single greatest cost to an individual bird.
  - B They have generally received more attention from scientists.
  - C They vary less from one bird species to another.

**Question 13 is based on the following reading passage.**

In the past ten years, there have been several improvements in mountain-climbing equipment. These improvements have made the sport both safer and more enjoyable for experienced climbers. Despite these improvements, however, the rate of mountain-climbing injuries has doubled in the past ten years.

13. Which of the following, if true, best reconciles the apparent discrepancy presented in the passage?
- A Many climbers, lulled into a false sense of security, use the new equipment to attempt climbing feats of which they are not capable.
  - B Some mountain-climbing injuries are caused by unforeseeable weather conditions.
  - C Mountain climbing, although a dangerous sport, does not normally result in injury to the experienced climber.
  - D In the past ten years there have been improvements in mountain-climbing techniques as well as in mountain-climbing equipment.
  - E Although the rate of mountain-climbing injuries has increased, the rate of mountain-climbing deaths has not changed.

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**For Questions 14 to 17, select one entry for each blank from the corresponding column of choices. Fill all blanks in the way that best completes the text.**

14. Unenlightened authoritarian managers rarely recognize a crucial reason for the low levels of serious conflict among members of democratically run work groups: a modicum of tolerance for dissent often prevents \_\_\_\_\_.

(A) demur
(B) schism
(C) cooperation
(D) compliance
(E) shortsightedness

15. The novelist devotes so much time to avid descriptions of his characters' clothes that the reader soon feels that such \_\_\_\_\_ concerns, although worthy of attention, have superseded any more directly literary aims.

(A) didactic
(B) syntactical
(C) irrelevant
(D) sartorial
(E) frivolous

16. Belanger dances with an (i) \_\_\_\_\_ that draws one's attention as if by seeking to (ii) \_\_\_\_\_ it; through finesse and understatement, he manages to seem at once intensely present and curiously detached.

Blank (i)

(A) undemonstrative panache
(B) unrestrained enthusiasm
(C) unattractive gawkiness

Blank (ii)

(D) focus
(E) overwhelm
(F) deflect

17. The most striking thing about the politician is how often his politics have been (i) \_\_\_\_\_ rather than ideological, as he adapts his political positions at any particular moment to the political realities that constrain him. He does not, however, piously (ii) \_\_\_\_\_ political principles only to betray them in practice. Rather, he attempts in subtle ways to balance his political self-interest with a (iii) \_\_\_\_\_, viewing himself as an instrument of some unchanging higher purpose.

Blank (i)

(A) quixotic
(B) self-righteous
(C) strategic

Blank (ii)

(D) brandish
(E) flout
(F) follow

Blank (iii)

(G) profound cynicism
(H) deeply felt moral code
(I) thoroughgoing pragmatism

For each of Questions 18 to 20, select one answer choice unless otherwise instructed.

Questions 18 to 20 are based on the following reading passage.

line The condition of scholarship devoted to the history of women in photography is con-  
 founding. Recent years have witnessed the posthumous inflation of the role of the  
 5 hobbyist Alice Austen into that of a pioneering documentarian while dozens of notable  
 senior figures — Marion Palfi, whose photographs of civil-rights activities in the South  
 served as early evidence of the need for protective legislation, to name one—received  
 scant attention from scholars. And, while Naomi Rosenblum’s synoptic *History of*  
*Women Photographers* covers the subject through 1920 in a generally useful fashion,  
 once she reaches the 1920s, when the venues, forms, applications, and movements of  
 the medium expanded exponentially, she resorts to an increasingly terse listing of un-  
 10 familiar names, with approaches and careers summarized in a sentence or two.

18. The author of the passage cites Rosenblum’s book most likely in order to
- (A) suggest that the works documented most thoroughly by historians of women in photography often do not warrant that attention
  - (B) offer an explanation for the observation that not all aspects of the history of women in photography have received the same level of attention
  - (C) provide an example of a way in which scholarship on the history of women in photography has been unsatisfactory
  - (D) suggest that employing a strictly chronological approach when studying the history of women in photography may be unproductive
  - (E) provide support for the notion that certain personalities in women’s photography have attained undue prominence

For the following question, consider each of the choices separately and select all that apply.

19. Which of the following statements about Marion Palfi is supported by the passage?
- (A) Marion Palfi’s photographs would have received greater recognition from historians had her work been done in an era when most aspects of photography were static rather than in a state of transition.
  - (B) Alice Austen has achieved greater notoriety than has Marion Palfi primarily because the subjects that Austen photographed were more familiar to her contemporaries.
  - (C) In addition to providing a record of certain historical events, Marion Palfi’s photographs played a role in subsequent events.
20. In the context in which it appears, “inflation” (line 2) most nearly means
- (A) exaggeration
  - (B) acquisition
  - (C) evaluation
  - (D) distortion
  - (E) attenuation

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**For Questions 21 to 25, select the two answer choices that, when used to complete the sentence, fit the meaning of the sentence as a whole and produce completed sentences that are alike in meaning.**

21. The plan, which the engineers said would save the aquifer by reducing pumping to \_\_\_\_\_ levels, has passed a governmental environmental review but faces opposition from outdoor and environmental groups.
- A innocuous
  - B feasible
  - C practicable
  - D minimal
  - E remedial
  - F benign
22. Though feminist in its implications, Yvonne Rainer's 1974 film \_\_\_\_\_ the filmmaker's active involvement in feminist politics.
- A antedated
  - B cloaked
  - C portrayed
  - D preceded
  - E renewed
  - F represented
23. Congress is having great difficulty developing a consensus on energy policy, primarily because the policy objectives of various members of Congress rest on such \_\_\_\_\_ assumptions.
- A commonplace
  - B disparate
  - C divergent
  - D fundamental
  - E trite
  - F trivial

24. During the opera's most famous aria, the tempo chosen by the orchestra's conductor seemed \_\_\_\_\_, without necessary relation to what had gone before.
- A arbitrary
  - B capricious
  - C cautious
  - D compelling
  - E exacting
  - F meticulous
25. Because they had expected the spacecraft Voyager 2 to be able to gather data only about the planets Jupiter and Saturn, scientists were \_\_\_\_\_ the wealth of information it sent back from Neptune twelve years after leaving Earth.
- A anxious for
  - B confident in
  - C thrilled about
  - D keen on
  - E elated by
  - F eager for

**STOP. This is the end of Section 3.**

**SECTION 4**  
**Verbal Reasoning**  
**Time—35 minutes**  
**25 Questions**

For Questions 1 to 4, select the two answer choices that, when used to complete the sentence, fit the meaning of the sentence as a whole and produce completed sentences that are alike in meaning.

1. Only by ignoring decades of mismanagement and inefficiency could investors conclude that a fresh infusion of cash would provide anything other than a \_\_\_\_\_ solution to the company's financial woes.  
 A complete  
 B fleeting  
 C momentary  
 D premature  
 E trivial  
 F total
  
2. Some scientists argue that carbon compounds play such a central role in life on Earth because of the possibility of \_\_\_\_\_ resulting from the carbon atom's ability to form an unending series of different molecules.  
 A diversity  
 B deviation  
 C variety  
 D reproduction  
 E stability  
 F invigoration
  
3. Given the flood of information presented by the mass media, the only way for someone to keep abreast of the news is to rely on \_\_\_\_\_ accounts.  
 A synoptic  
 B abridged  
 C sensational  
 D copious  
 E lurid  
 F understated

4. Always circumspect, she was reluctant to make judgments, but once arriving at a conclusion, she was \_\_\_\_\_ in its defense.
- A deferential
  - B intransigent
  - C lax
  - D negligent
  - E obsequious
  - F resolute



For each of Questions 5 to 9, select one answer choice unless otherwise instructed.

Questions 5 and 6 are based on the following reading passage.

When marine organisms called phytoplankton photosynthesize, they absorb carbon dioxide dissolved in seawater, potentially causing a reduction in the concentration of atmospheric carbon dioxide, a gas that contributes to global warming. However, phytoplankton flourish only in surface waters where iron levels are sufficiently high. Martin therefore hypothesized that adding iron to iron-poor regions of the ocean could help alleviate global warming. While experiments subsequently confirmed that such a procedure increases phytoplankton growth, field tests have shown that such growth does not significantly lower atmospheric carbon dioxide. When phytoplankton utilize carbon dioxide for photosynthesis, the carbon becomes a building block for organic matter, but the carbon leaks back into the atmosphere when predators consume the phytoplankton and respire carbon dioxide.

For the following question, consider each of the choices separately and select all that apply.

5. It can be inferred from the passage that Martin's hypothesis includes which of the following elements?
- A A correct understanding of how phytoplankton photosynthesis utilizes carbon dioxide
  - B A correct prediction about how the addition of iron to iron-poor waters would affect phytoplankton growth
  - C An incorrect prediction about how phytoplankton growth would affect the concentration of atmospheric carbon dioxide
6. It can be inferred that the author of the passage mentions predators (line 10) primarily in order to
- A help explain why Martin's hypothesis is incorrect
  - B identify one effect of adding iron to iron-poor waters
  - C indicate how some carbon dioxide is converted to solid organic matter
  - D help account for differences in the density of phytoplankton between different regions of the ocean
  - E point out a factor that was not anticipated by the scientists who conducted the field tests mentioned in the passage

**Question 7 is based on the following reading passage.**

Sparva, unlike Ireland's other provinces, requires automobile insurers to pay for any medical treatment sought by someone who has been involved in an accident; in the other provinces, insurers pay for nonemergency treatment only if they preapprove the treatment. Clearly, Sparva's less restrictive policy must be the explanation for the fact that altogether insurers there pay for far more treatments after accidents than insurers in other provinces, even though Sparva does not have the largest population.

7. Which of the following, if true, most strengthens the argument?
- (A) Car insurance costs more in Sparva than in any other province.
  - (B) The cost of medical care in Sparva is higher than the national average.
  - (C) Different insurance companies have different standards for determining what constitutes emergency treatment.
  - (D) Fewer insurance companies operate in Sparva than in any other province.
  - (E) There are fewer traffic accidents annually in Sparva than in any of the provinces of comparable or greater population.

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**Questions 8 and 9 are based on the following reading passage.**

*Elements of the Philosophy of Newton*, published by Voltaire in 1738, was an early attempt to popularize the scientific ideas of Isaac Newton. In the book's frontispiece, Voltaire is seen writing at his desk, and over him a shaft of light from heaven, the light of truth, passes through Newton to Voltaire's collaborator Madame du Châtelet; she reflects that light onto the inspired Voltaire. Voltaire's book commanded a wide audience, according to Feingold, because "he was neither a mathematician nor a physicist, but a literary giant aloof from the academic disputes over Newtonian ideas." In other words, Voltaire's amateurism in science "was a source of his contemporary appeal, demonstrating for the first time the accessibility of Newton's ideas to nonspecialists."

**For the following question, consider each of the choices separately and select all that apply.**

8. Which of the following statements about Voltaire's *Elements of the Philosophy of Newton* can be inferred from the passage?
- A Voltaire's literary stature helped secure a large audience for this attempt to popularize Newton's ideas.
  - B Voltaire's status as a nonscientist was an advantage in this effort to bring Newtonian science to the attention of the general public.
  - C The frontispiece of the book implies that Voltaire's understanding of Newton's ideas was not achieved without assistance.
9. Select the sentence that describes an allegory for Voltaire's acquisition of knowledge concerning Newton's ideas.

**For Questions 10 to 13, select one entry for each blank from the corresponding column of choices. Fill all blanks in the way that best completes the text.**

10. Ironically, the writer so wary of (i) \_\_\_\_\_ was (ii) \_\_\_\_\_ with ink and paper, his novel running to 2,500 shagreen-bound folio pages—a fortune in stationery at the time.

Blank (i)

<input type="radio"/> A probity
<input type="radio"/> B extravagance
<input type="radio"/> C disapprobation

Blank (ii)

<input type="radio"/> D acquisitive
<input type="radio"/> E illiberal
<input type="radio"/> F profligate

11. What readers most commonly remember about John Stuart Mill's classic exploration of the liberty of thought and discussion concerns the danger of (i) \_\_\_\_\_: in the absence of challenge, one's opinions, even when they are correct, grow weak and flabby. Yet Mill had another reason for encouraging the liberty of thought and discussion: the danger of partiality and incompleteness. Since one's opinions, even under the best circumstances, tend to (ii) \_\_\_\_\_, and because opinions opposed to one's own rarely turn out to be completely (iii) \_\_\_\_\_, it is crucial to supplement one's opinions with alternative points of view.

Blank (i)

(A) tendentiousness
(B) complacency
(C) fractiousness

Blank (ii)

(D) embrace only a portion of the truth
(E) change over time
(F) focus on matters close at hand

Blank (iii)

(G) erroneous
(H) antithetical
(I) immutable

12. Just as the authors' book on eels is often a key text for courses in marine vertebrate zoology, their ideas on animal development and phylogeny \_\_\_\_\_ teaching in this area.

(A) prevent
(B) defy
(C) replicate
(D) inform
(E) use

13. Mechanisms develop whereby every successful species can \_\_\_\_\_ its innate capacity for population growth with the constraints that arise through its interactions with the natural environment.

(A) enhance
(B) replace
(C) produce
(D) surpass
(E) reconcile

For each of Questions 14 to 16, select one answer choice unless otherwise instructed.

Questions 14 to 16 are based on the following reading passage.

It would be expected that a novel by a figure as prominent as W. E. B. DuBois would attract the attention of literary critics. Additionally, when the novel subtly engages the issue of race, as DuBois' *The Quest of the Silver Fleece* (1911) does, it would be a surprise not to encounter an abundance of scholarly work about that text. But though valuable scholarship has examined DuBois' political and historical thought, his novels have received scant attention. Perhaps DuBois the novelist must wait his turn behind DuBois the philosopher, historian, and editor. But what if the truth lies elsewhere: what if his novels do not speak to current concerns?

14. Which of the following can be inferred from the passage regarding DuBois' *The Quest of the Silver Fleece*?
- (A) The lack of attention devoted to *The Quest of the Silver Fleece* can be attributed to the fact that it was DuBois' first novel.
  - (B) Among DuBois' novels, *The Quest of the Silver Fleece* is unusual in that it has received scant attention from scholars.
  - (C) *The Quest of the Silver Fleece* has at least one feature that typically would attract the attention of literary scholars.
  - (D) *The Quest of the Silver Fleece*, given its subtle exploration of race, is probably the best novel written by DuBois.
  - (E) Much of the scholarly work that has focused on *The Quest of the Silver Fleece* has been surprisingly critical of it.
15. In the fourth sentence ("Perhaps DuBois . . . editor."), the author of the passage is most likely suggesting that
- (A) scholars will find that DuBois' novels are more relevant to current concerns than is his work as philosopher, historian, and editor
  - (B) more scholarly attention will be paid to *The Quest of the Silver Fleece* than to DuBois' other novels
  - (C) DuBois' novels will come to overshadow his work as philosopher, historian, and editor
  - (D) DuBois' novels may eventually attract greater scholarly interest than they have to date
  - (E) it will be shown that DuBois' work as philosopher, historian, and editor had an important influence on his work as novelist

16. Which of the following best describes the central issue with which the passage is concerned?
- (A) The perfunctoriness of much of the critical work devoted to DuBois' novels
  - (B) The nature of DuBois' engagement with the issue of race in *The Quest of the Silver Fleece*
  - (C) Whether DuBois' novels are of high quality and relevant to current concerns
  - (D) The relationship between DuBois the novelist and DuBois the philosopher, historian, and editor
  - (E) The degree of consideration that has been given to DuBois' novels, including *The Quest of the Silver Fleece*

**For Questions 17 to 20, select one entry for each blank from the corresponding column of choices. Fill all blanks in the way that best completes the text.**

17. In the midst of so many evasive comments, this forthright statement, whatever its intrinsic merit, plainly stands out as \_\_\_\_\_.

(A) a paradigm
(B) a misnomer
(C) a profundity
(D) an inaccuracy
(E) an anomaly

18. The activists' energetic work in the service of both woman suffrage and the temperance movement in the late nineteenth century (i) \_\_\_\_\_ the assertion that the two movements were (ii) \_\_\_\_\_.

Blank (i)

Blank (ii)

(A) undermines
(B) supports
(C) underscores

(D) diffuse
(E) inimical
(F) predominant

19. There is nothing quite like this movie, and indeed I am not altogether sure there is much more to it than its lovely (i) \_\_\_\_\_. At a moment when so many films strive to be as (ii) \_\_\_\_\_ as possible, it is gratifying to find one that is so subtle and puzzling.

Blank (i)

Blank (ii)

(A) peculiarity
(B) pellucidity
(C) conventionality

(D) indirect
(E) assertive
(F) enigmatic

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20. Wills argues that certain malarial parasites are especially (i)\_\_\_\_\_ because they have more recently entered humans than other species and therefore have had (ii)\_\_\_\_\_ time to evolve toward (iii)\_\_\_\_\_. Yet there is no reliable evidence that the most harmful *Plasmodium* species has been in humans for a shorter time than less harmful species.

Blank (i)

(A) populous
(B) malignant
(C) threatened

Blank (ii)

(D) ample
(E) insufficient
(F) adequate

Blank (iii)

(G) virulence
(H) benignity
(I) variability

**For each of Questions 21 to 25, select one answer choice unless otherwise instructed.**

**Question 21 is based on the following reading passage.**

Saturn's giant moon Titan is the only planetary satellite with a significant atmosphere and the only body in the solar system other than Earth that has a thick atmosphere dominated by molecular nitrogen. For a long time, the big question about Titan's atmosphere was how it could be so thick, given that Jupiter's moons Ganymede and Callisto, which are the same size as Titan, have none. The conditions for acquiring and retaining a thick nitrogen atmosphere are now readily understood. The low temperature of the protosaturnian nebula enabled Titan to acquire the moderately volatile compounds methane and ammonia (later converted to nitrogen) in addition to water. The higher temperatures of Jupiter's moons, which were closer to the Sun, prevented them from acquiring such an atmosphere.

21. According to the passage, Titan differs atmospherically from Ganymede and Callisto because of a difference in
- (A) rate of heat loss
  - (B) proximity to the Sun
  - (C) availability of methane and ammonia
  - (D) distance from its planet
  - (E) size

Question 22 is based on the following reading passage.

Observations of the Arctic reveal that the Arctic Ocean is covered by less ice each summer than the previous summer. If this warming trend continues, within 50 years the Arctic Ocean will be ice free during the summer months. This occurrence would in itself have little or no effect on global sea levels, since the melting of ice floating in water does not affect the water level. However, serious consequences to sea levels would eventually result, because \_\_\_\_\_.

22. Which of the following most logically completes the passage?
- (A) large masses of floating sea ice would continue to form in the wintertime
  - (B) significant changes in Arctic sea temperatures would be accompanied by changes in sea temperatures in more temperate parts of the world
  - (C) such a warm Arctic Ocean would trigger the melting of massive land-based glaciers in the Arctic
  - (D) an ice-free Arctic Ocean would support a very different ecosystem than it does presently
  - (E) in the spring, melting sea ice would cause more icebergs to be created and to drift south into shipping routes



**Questions 23 to 25 are based on the following reading passage.**

In a recent study, David Cressy examines two central questions concerning English immigration to New England in the 1630s: what kinds of people immigrated and why? Using contemporary literary evidence, shipping lists, and customs records, Cressy finds that most adult immigrants were skilled in farming or crafts, were literate, and were organized in families. Each of these characteristics sharply distinguishes the 21,000 people who left for New England in the 1630s from most of the approximately 377,000 English people who had immigrated to America by 1700.

With respect to their reasons for immigrating, Cressy does not deny the frequently noted fact that some of the immigrants of the 1630s, most notably the organizers and clergy, advanced religious explanations for departure, but he finds that such explanations usually assumed primacy only in retrospect. When he moves beyond the principal actors, he finds that religious explanations were less frequently offered, and he concludes that most people immigrated because they were recruited by promises of material improvement.

**For the following question, consider each of the choices separately and select all that apply.**

23. The passage indicates that Cressy would agree with which of the following statements about the organizers among the English immigrants to New England in the 1630s?
- A Some of them offered a religious explanation for their immigration.
  - B They did not offer any reasons for their immigration until some time after they had immigrated.
  - C They were more likely than the average immigrant to be motivated by material considerations.
24. Select the sentence that provides Cressy's opinion about what motivated English immigrants to go to New England in the 1630s.
25. In the passage, the author is primarily concerned with
- A summarizing the findings of an investigation
  - B analyzing a method of argument
  - C evaluating a point of view
  - D hypothesizing about a set of circumstances
  - E establishing categories

**STOP. This is the end of Section 4.**

**SECTION 5**  
**Quantitative Reasoning**  
**Time—40 minutes**  
**25 Questions**

For each question, indicate the best answer, using the directions given.

**Notes:** All numbers used are real numbers.

All figures are assumed to lie in a plane unless otherwise indicated.

Geometric figures, such as lines, circles, triangles, and quadrilaterals, **are not necessarily** drawn to scale. That is, you should **not** assume that quantities such as lengths and angle measures are as they appear in a figure. You should assume, however, that lines shown as straight are actually straight, points on a line are in the order shown, and more generally, all geometric objects are in the relative positions shown. For questions with geometric figures, you should base your answers on geometric reasoning, not on estimating or comparing quantities by sight or by measurement.

Coordinate systems, such as  $xy$ -planes and number lines, **are** drawn to scale; therefore, you can read, estimate, or compare quantities in such figures by sight or by measurement.

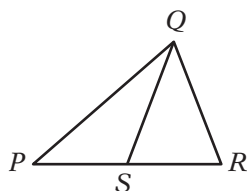
Graphical data presentations, such as bar graphs, circle graphs, and line graphs, **are** drawn to scale; therefore, you can read, estimate, or compare data values by sight or by measurement.

For each of Questions 1 to 9, compare Quantity A and Quantity B, using additional information centered above the two quantities if such information is given. Select one of the following four answer choices and fill in the corresponding oval to the right of the question.

- (A) Quantity A is greater.
- (B) Quantity B is greater.
- (C) The two quantities are equal.
- (D) The relationship cannot be determined from the information given.

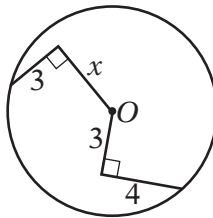
A symbol that appears more than once in a question has the same meaning throughout the question.

	<u>Quantity A</u>	<u>Quantity B</u>	<u>Correct Answer</u>
Example 1:	(2)(6)	$2 + 6$	<input checked="" type="radio"/> (A) <input type="radio"/> (B) <input type="radio"/> (C) <input type="radio"/> (D)



	<u>Quantity A</u>	<u>Quantity B</u>	<u>Correct Answer</u>
Example 2:	$PS$	$SR$	<input type="radio"/> (A) <input type="radio"/> (B) <input type="radio"/> (C) <input type="radio"/> (D)
			(since equal lengths cannot be assumed, even though $PS$ and $SR$ appear equal)

- (A) Quantity A is greater.
- (B) Quantity B is greater.
- (C) The two quantities are equal.
- (D) The relationship cannot be determined from the information given.



$O$  is the center of the circle above.

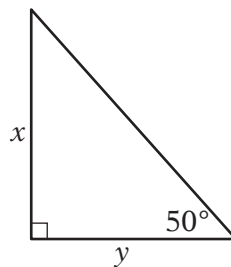
- |    | <u>Quantity A</u> | <u>Quantity B</u> |                 |
|----|-------------------|-------------------|-----------------|
| 1. | $x$               | 5                 | (A) (B) (C) (D) |
- 

Runner  $A$  ran  $\frac{4}{5}$  kilometer and Runner  $B$  ran 800 meters.

- |    | <u>Quantity A</u>         | <u>Quantity B</u>         |                 |
|----|---------------------------|---------------------------|-----------------|
| 2. | The distance that $A$ ran | The distance that $B$ ran | (A) (B) (C) (D) |
- 

$$x < y < z$$

- |    | <u>Quantity A</u>     | <u>Quantity B</u> |                 |
|----|-----------------------|-------------------|-----------------|
| 3. | $\frac{x + y + z}{3}$ | $y$               | (A) (B) (C) (D) |
- 



- |    | <u>Quantity A</u> | <u>Quantity B</u> |                 |
|----|-------------------|-------------------|-----------------|
| 4. | $\frac{x}{y}$     | 1                 | (A) (B) (C) (D) |

- Ⓐ Quantity A is greater.  
 Ⓑ Quantity B is greater.  
 Ⓒ The two quantities are equal.  
 Ⓓ The relationship cannot be determined from the information given.

$$0 < x < y < 1$$

- |    | <u>Quantity A</u> | <u>Quantity B</u> |         |
|----|-------------------|-------------------|---------|
| 5. | $1 - y$           | $y - x$           | Ⓐ Ⓑ Ⓒ Ⓓ |
- 

$p$  is the probability that event  $E$  will occur, and  $s$  is the probability that event  $E$  will not occur.

- |    | <u>Quantity A</u> | <u>Quantity B</u> |         |
|----|-------------------|-------------------|---------|
| 6. | $p + s$           | $ps$              | Ⓐ Ⓑ Ⓒ Ⓓ |
- 

$X$  is the set of all integers  $n$  that satisfy the inequality  $2 \leq |n| \leq 5$ .

- |    | <u>Quantity A</u>                                 | <u>Quantity B</u>                              |         |
|----|---|--|---------|
| 7. | The absolute value of the greatest integer in $X$ | The absolute value of the least integer in $X$ | Ⓐ Ⓑ Ⓒ Ⓓ |
- 

$x$  and  $m$  are positive numbers, and  $m$  is a multiple of 3.

- |    | <u>Quantity A</u> | <u>Quantity B</u> |         |
|----|-------------------|-------------------|---------|
| 8. | $\frac{x^m}{x^3}$ | $x^{m/3}$         | Ⓐ Ⓑ Ⓒ Ⓓ |
- 

A random variable  $Y$  is normally distributed with a mean of 200 and a standard deviation of 10.

- |    | <u>Quantity A</u>  | <u>Quantity B</u> |         |
|----|--|-------------------|---------|
| 9. | The probability of the event that the value of $Y$ is greater than 220 | $\frac{1}{6}$     | Ⓐ Ⓑ Ⓒ Ⓓ |

**GO ON TO THE NEXT PAGE** ➤

Questions 10 to 25 have several different formats. Unless otherwise directed, select a single answer choice. For Numeric Entry questions, follow the instructions below.

**Numeric Entry Questions**

Enter your answer in the answer box(es) below the question.

- Your answer may be an integer, a decimal, or a fraction, and it may be negative.
- If a question asks for a fraction, there will be two boxes—one for the numerator and one for the denominator.
- Equivalent forms of the correct answer, such as 2.5 and 2.50, are all correct. Fractions do not need to be reduced to lowest terms.
- Enter the exact answer unless the question asks you to round your answer.

10. The ratio of  $\frac{1}{3}$  to  $\frac{3}{8}$  is equal to the ratio of

- (A) 1 to 8
- (B) 8 to 1
- (C) 8 to 3
- (D) 8 to 9
- (E) 9 to 8

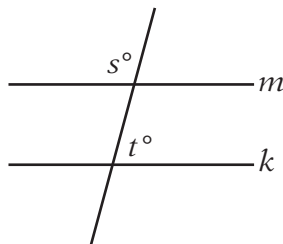
11. A reading list for a humanities course consists of 10 books, of which 4 are biographies and the rest are novels. Each student is required to read a selection of 4 books from the list, including 2 or more biographies. How many selections of 4 books satisfy the requirements?

- (A) 90
- (B) 115
- (C) 130
- (D) 144
- (E) 195

**For the following question, enter your answer in the box.**

12. In a graduating class of 236 students, 142 took algebra and 121 took chemistry. What is the greatest possible number of students that could have taken both algebra and chemistry?

students



13. In the figure above, if  $m \parallel k$  and  $s = t + 30$ , then  $t =$
- (A) 30  
 (B) 60  
 (C) 75  
 (D) 80  
 (E) 105
14. If  $2x = 3y = 4z = 20$ , then  $12xyz =$
- (A) 16,000  
 (B) 8,000  
 (C) 4,000  
 (D) 800  
 (E) 10

**For the following question, select all the answer choices that apply.**

15. The total amount that Mary paid for a book was equal to the price of the book plus a sales tax that was 4 percent of the price of the book. Mary paid for the book with a \$10 bill and received the correct change, which was less than \$3.00. Which of the following statements must be true?

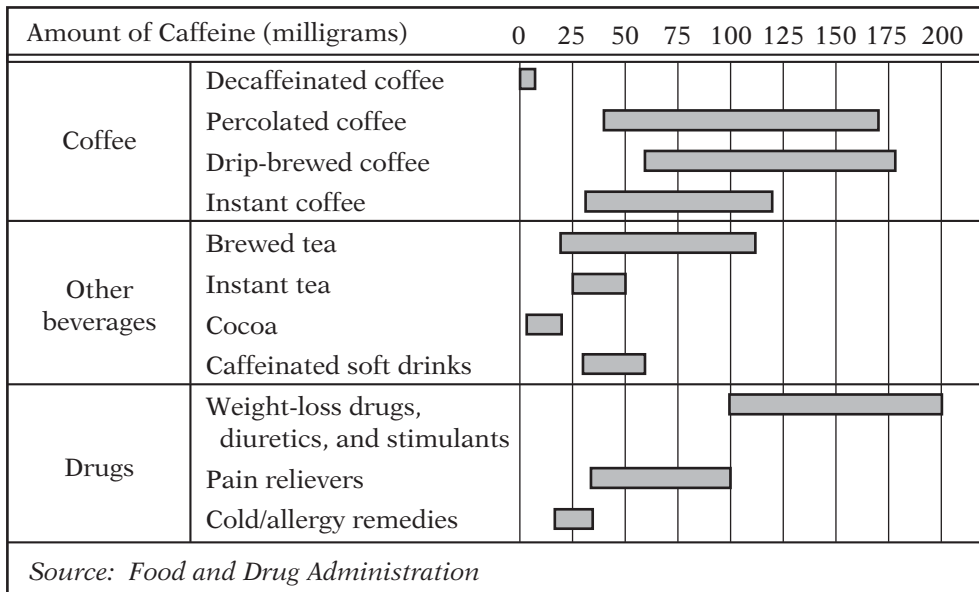
Indicate all such statements.

- (A) The price of the book was less than \$9.50.  
 (B) The price of the book was greater than \$6.90.  
 (C) The sales tax was less than \$0.45.
16. If  $\frac{1}{(2^{11})(5^{17})}$  is expressed as a terminating decimal, how many nonzero digits will the decimal have?
- (A) One  
 (B) Two  
 (C) Four  
 (D) Six  
 (E) Eleven

GO ON TO THE NEXT PAGE

Questions 17 to 20 are based on the following data.

VARIATION IN THE AMOUNT OF CAFFEINE IN COMMON BEVERAGES AND DRUGS\*



\*Based on 5-ounce cups of coffee, tea, and cocoa; 12-ounce cups of soft drinks; and single doses of drugs.

17. The least amount of caffeine in a 5-ounce cup of drip-brewed coffee exceeds the greatest amount of caffeine in a 5-ounce cup of cocoa by approximately how many milligrams?
- (A) 160
  - (B) 80
  - (C) 60
  - (D) 40
  - (E) 20

For the following question, enter your answer in the box.

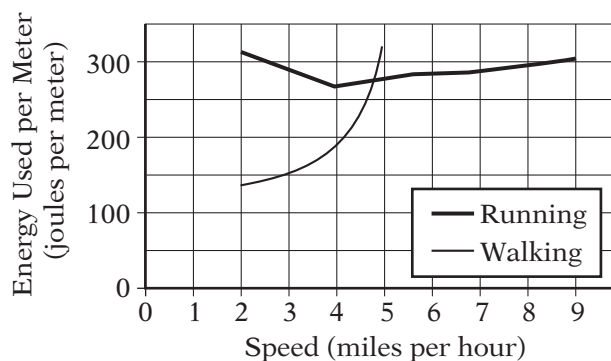
18. For how many of the 11 categories of beverages and drugs listed in the graph can the amount of caffeine in the given serving size be less than 50 milligrams?

categories

19. Approximately what is the minimum amount of caffeine, in milligrams, consumed per day by a person who daily drinks two 10-ounce mugs of percolated coffee and one 12-ounce cup of a caffeinated soft drink?
- (A) 230
  - (B) 190
  - (C) 140
  - (D) 110
  - (E) 70

20. Which of the following shows the four types of coffee listed in order according to the range of the amounts of caffeine in a 5-ounce cup, from the least range to the greatest range?
- (A) Decaffeinated, instant, percolated, drip-brewed  
 (B) Decaffeinated, instant, drip-brewed, percolated  
 (C) Instant, decaffeinated, drip-brewed, percolated  
 (D) Instant, drip-brewed, decaffeinated, percolated  
 (E) Instant, percolated, drip-brewed, decaffeinated

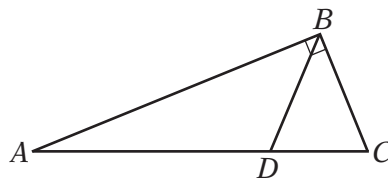
ENERGY USED PER METER VERSUS SPEED  
DURING RUNNING AND WALKING



21. If  $s$  is a speed, in miles per hour, at which the energy used per meter during running is twice the energy used per meter during walking, then, according to the graph above,  $s$  is between
- (A) 2.5 and 3.0  
 (B) 3.0 and 3.5  
 (C) 3.5 and 4.0  
 (D) 4.0 and 4.5  
 (E) 4.5 and 5.0
22. If  $n = 2^3$ , then  $n^n =$
- (A)  $2^6$   
 (B)  $2^{11}$   
 (C)  $2^{18}$   
 (D)  $2^{24}$   
 (E)  $2^{27}$



For the following question, select all the answer choices that apply.



The length of  $AB$  is  $10\sqrt{3}$ .

23. Which of the following statements individually provide(s) sufficient additional information to determine the area of triangle  $ABC$  above?

Indicate all such statements.

- A  $DBC$  is an equilateral triangle.  
 B  $ABD$  is an isosceles triangle.  
 C The length of  $BC$  is equal to the length of  $AD$ .  
 D The length of  $BC$  is 10.  
 E The length of  $AD$  is 10.

For the following question, enter your answer in the box.

$$a_1, a_2, a_3, \dots, a_n, \dots$$

24. In the sequence above, each term after the first term is equal to the preceding term plus the constant  $c$ . If  $a_1 + a_3 + a_5 = 27$ , what is the value of  $a_2 + a_4$ ?

$$a_2 + a_4 = \boxed{\phantom{000}}$$

25. A desert outpost has a water supply that is sufficient to last 21 days for 15 people. At the same average rate of water consumption per person, how many days would the water supply last for 9 people?
- A 28.0  
 B 32.5  
 C 35.0  
 D 37.5  
 E 42.0

**STOP. This is the end of Section 5.**

**SECTION 6**  
**Quantitative Reasoning**  
**Time—40 minutes**  
**25 Questions**

For each question, indicate the best answer, using the directions given.

**Notes:** All numbers used are real numbers.

All figures are assumed to lie in a plane unless otherwise indicated.

Geometric figures, such as lines, circles, triangles, and quadrilaterals, **are not necessarily** drawn to scale. That is, you should **not** assume that quantities such as lengths and angle measures are as they appear in a figure. You should assume, however, that lines shown as straight are actually straight, points on a line are in the order shown, and more generally, all geometric objects are in the relative positions shown. For questions with geometric figures, you should base your answers on geometric reasoning, not on estimating or comparing quantities by sight or by measurement.

Coordinate systems, such as  $xy$ -planes and number lines, **are** drawn to scale; therefore, you can read, estimate, or compare quantities in such figures by sight or by measurement.

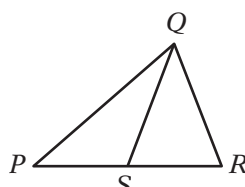
Graphical data presentations, such as bar graphs, circle graphs, and line graphs, **are** drawn to scale; therefore, you can read, estimate, or compare data values by sight or by measurement.

For each of Questions 1 to 9, compare Quantity A and Quantity B, using additional information centered above the two quantities if such information is given. Select one of the following four answer choices and fill in the corresponding oval to the right of the question.

- (A) Quantity A is greater.  
 (B) Quantity B is greater.  
 (C) The two quantities are equal.  
 (D) The relationship cannot be determined from the information given.

A symbol that appears more than once in a question has the same meaning throughout the question.

	<u>Quantity A</u>	<u>Quantity B</u>	<u>Correct Answer</u>
Example 1:	(2)(6)	2+6	(A) (B) (C) (D)

	<u>Quantity A</u>	<u>Quantity B</u>	<u>Correct Answer</u>
	<u>PS</u>	<u>SR</u>	(A) (B) (C) (D)
Example 2:			(since equal lengths cannot be assumed, even though PS and SR appear equal)

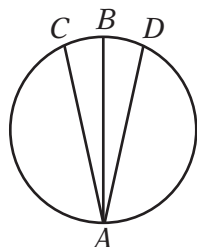
- (A) Quantity A is greater.
- (B) Quantity B is greater.
- (C) The two quantities are equal.
- (D) The relationship cannot be determined from the information given.

Country	Value of 1 United States Dollar
Argentina	0.93 peso
Kenya	32.08 shillings

- Quantity A
Quantity B
1. The dollar value of 1 Argentine peso according to the table above      The dollar value of 1 Kenyan shilling according to the table above      (A) (B) (C) (D)

$k$  is a digit in the decimal  $1.3k5$ , and  $1.3k5$  is less than  $1.33$ .

- Quantity A
Quantity B
2.  $k$       1      (A) (B) (C) (D)



$AB$  is a diameter of the circle above.

- Quantity A
Quantity B
3. The length of  $AB$       The average (arithmetic mean) of the lengths of  $AC$  and  $AD$       (A) (B) (C) (D)

$$st = \sqrt{10}$$

- Quantity A
Quantity B
4.  $s^2$        $\frac{10}{t^2}$       (A) (B) (C) (D)

- Ⓐ Quantity A is greater.  
 Ⓑ Quantity B is greater.  
 Ⓒ The two quantities are equal.  
 Ⓓ The relationship cannot be determined from the information given.

Three consecutive integers have a sum of  $-84$ .

- |    | <u>Quantity A</u>               | <u>Quantity B</u> |         |
|----|---------------------------------|-------------------|---------|
| 5. | The least of the three integers | $-28$             | Ⓐ Ⓑ Ⓒ Ⓓ |
- 

In the  $xy$ -plane, the equation of line  $k$  is  $3x - 2y = 0$ .

- |    | <u>Quantity A</u>              | <u>Quantity B</u>              |         |
|----|--------------------------------|--------------------------------|---------|
| 6. | The $x$ -intercept of line $k$ | The $y$ -intercept of line $k$ | Ⓐ Ⓑ Ⓒ Ⓓ |
- 

$n$  is a positive integer that is divisible by 6.

- |    | <u>Quantity A</u>                       | <u>Quantity B</u>                       |         |
|----|---|---|---------|
| 7. | The remainder when $n$ is divided by 12 | The remainder when $n$ is divided by 18 | Ⓐ Ⓑ Ⓒ Ⓓ |
- 

$$\frac{1-x}{x-1} = \frac{1}{x}$$

- |    | <u>Quantity A</u> | <u>Quantity B</u> |         |
|----|-------------------|-------------------|---------|
| 8. | $x$               | $-\frac{1}{2}$    | Ⓐ Ⓑ Ⓒ Ⓓ |
- 

In a set of 24 positive integers, 12 of the integers are less than 50. The rest are greater than 50.

- |    | <u>Quantity A</u>             | <u>Quantity B</u> |         |
|----|-------------------------------|-------------------|---------|
| 9. | The median of the 24 integers | $50$              | Ⓐ Ⓑ Ⓒ Ⓓ |

GO ON TO THE NEXT PAGE

Questions 10 to 25 have several different formats. Unless otherwise directed, select a single answer choice. For Numeric Entry questions, follow the instructions below.

**Numeric Entry Questions**

Enter your answer in the answer box(es) below the question.

- Your answer may be an integer, a decimal, or a fraction, and it may be negative.
- If a question asks for a fraction, there will be two boxes—one for the numerator and one for the denominator.
- Equivalent forms of the correct answer, such as 2.5 and 2.50, are all correct. Fractions do not need to be reduced to lowest terms.
- Enter the exact answer unless the question asks you to round your answer.

10. The fabric needed to make 3 curtains sells for \$8.00 per yard and can be purchased only by the full yard. If the length of fabric required for each curtain is 1.6 yards and all of the fabric is purchased as a single length, what is the total cost of the fabric that needs to be purchased for the 3 curtains?
- (A) \$40.00  
(B) \$38.40  
(C) \$24.00  
(D) \$16.00  
(E) \$12.80

For the following question, select all the answer choices that apply.

11. In the  $xy$ -plane, line  $k$  is a line that does not pass through the origin.

Which of the following statements individually provide(s) sufficient additional information to determine whether the slope of line  $k$  is negative?

Indicate all such statements.

- (A) The  $x$ -intercept of line  $k$  is twice the  $y$ -intercept of line  $k$ .  
(B) The product of the  $x$ -intercept and the  $y$ -intercept of line  $k$  is positive.  
(C) Line  $k$  passes through the points  $(a, b)$  and  $(r, s)$ , where  $(a - r)(b - s) < 0$ .

	Distance from Centerville (miles)
Freight train	$-10t + 115$
Passenger train	$-20t + 150$

12. The expressions in the table above give the distance from Centerville to each of two trains  $t$  hours after 12:00 noon. At what time after 12:00 noon will the trains be equidistant from Centerville?
- (A) 1:30  
 (B) 3:30  
 (C) 5:10  
 (D) 8:50  
 (E) 11:30
13. The company at which Mark is employed has 80 employees, each of whom has a different salary. Mark's salary of \$43,700 is the second-highest salary in the first quartile of the 80 salaries. If the company were to hire 8 new employees at salaries that are less than the lowest of the 80 salaries, what would Mark's salary be with respect to the quartiles of the 88 salaries at the company, assuming no other changes in the salaries?
- (A) The fourth-highest salary in the first quartile  
 (B) The highest salary in the first quartile  
 (C) The second-lowest salary in the second quartile  
 (D) The third-lowest salary in the second quartile  
 (E) The fifth-lowest salary in the second quartile

**For the following question, enter your answer in the box.**

14. In the  $xy$ -plane, the point with coordinates  $(-6, -7)$  is the center of circle  $C$ . The point with coordinates  $(-6, 5)$  lies inside  $C$ , and the point with coordinates  $(8, -7)$  lies outside  $C$ . If  $m$  is the radius of  $C$  and  $m$  is an integer, what is the value of  $m$ ?

$$m = \boxed{\phantom{000}}$$

15. If  $-\frac{m}{19}$  is an even integer, which of the following must be true?
- (A)  $m$  is a negative number.  
 (B)  $m$  is a positive number.  
 (C)  $m$  is a prime number.  
 (D)  $m$  is an odd integer.  
 (E)  $m$  is an even integer.

**GO ON TO THE NEXT PAGE** ➤

For the following question, select all the answer choices that apply.

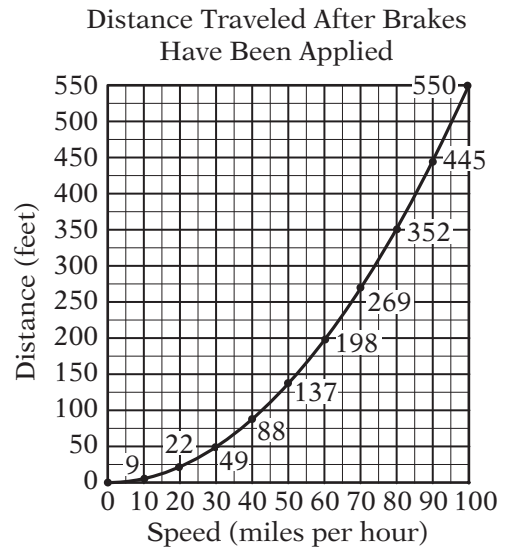
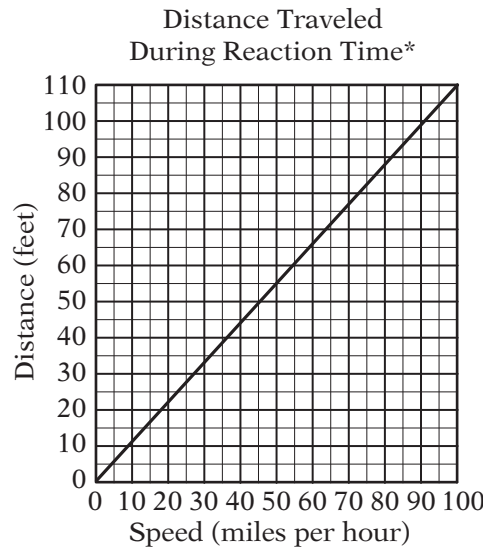
16. The integer  $v$  is greater than 1. If  $v$  is the square of an integer, which of the following numbers must also be the square of an integer?

Indicate all such numbers.

- A  $81v$
- B  $25v + 10\sqrt{v} + 1$
- C  $4v^2 + 4\sqrt{v} + 1$

Questions 17 to 20 are based on the following data.

DISTANCE TRAVELED BY A CAR ACCORDING TO THE CAR'S SPEED WHEN THE DRIVER IS SIGNALLED TO STOP



\*Reaction time is the time period that begins when the driver is signaled to stop and ends when the driver applies the brakes.

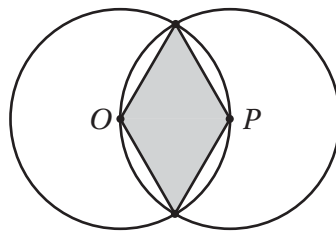
Note: Total stopping distance is the sum of the distance traveled during reaction time and the distance traveled after brakes have been applied.

17. The speed, in miles per hour, at which the car travels a distance of 52 feet during reaction time is closest to which of the following?
- A 43
  - B 47
  - C 51
  - D 55
  - E 59

18. Approximately what is the total stopping distance, in feet, if the car is traveling at a speed of 40 miles per hour when the driver is signaled to stop?
- (A) 130  
(B) 110  
(C) 90  
(D) 70  
(E) 40
19. Of the following, which is the greatest speed, in miles per hour, at which the car can travel and stop with a total stopping distance of less than 200 feet?
- (A) 50  
(B) 55  
(C) 60  
(D) 65  
(E) 70
20. The total stopping distance for the car traveling at 60 miles per hour is approximately what percent greater than the total stopping distance for the car traveling at 50 miles per hour?
- (A) 22%  
(B) 30%  
(C) 38%  
(D) 45%  
(E) 52%
21. What is the least positive integer that is not a factor of 25! and is not a prime number?
- (A) 26  
(B) 28  
(C) 36  
(D) 56  
(E) 58
22. If  $0 < a < 1 < b$ , which of the following is true about the reciprocals of  $a$  and  $b$ ?
- (A)  $1 < \frac{1}{a} < \frac{1}{b}$   
(B)  $\frac{1}{a} < 1 < \frac{1}{b}$   
(C)  $\frac{1}{a} < \frac{1}{b} < 1$   
(D)  $\frac{1}{b} < 1 < \frac{1}{a}$   
(E)  $\frac{1}{b} < \frac{1}{a} < 1$

GO ON TO THE NEXT PAGE 





23. In the figure above,  $O$  and  $P$  are the centers of the two circles. If each circle has radius  $r$ , what is the area of the shaded region?
- (A)  $\frac{\sqrt{2}}{2}r^2$
- (B)  $\frac{\sqrt{3}}{2}r^2$
- (C)  $\sqrt{2}r^2$
- (D)  $\sqrt{3}r^2$
- (E)  $2\sqrt{3}r^2$

**For the following question, enter your answer in the boxes.**

24. Of the 20 lightbulbs in a box, 2 are defective. An inspector will select 2 lightbulbs simultaneously and at random from the box. What is the probability that neither of the lightbulbs selected will be defective?

Give your answer as a fraction.


25. What is the perimeter, in meters, of a rectangular playground 24 meters wide that has the same area as a rectangular playground 64 meters long and 48 meters wide?
- (A) 112
- (B) 152
- (C) 224
- (D) 256
- (E) 304

**STOP. This is the end of Section 6.**

# Answer Key

## Section 3. Verbal Reasoning

<i>Question Number</i>	<i>P+</i>	<i>Correct Answer</i>
1	39	<b>Choice A:</b> Some record or evidence of the thought of the <i>tlamatinime</i> is available. AND <b>Choice B:</b> For at least some Nahuatl expressions, researchers are able to trace their derivation from another ancient American language.
2	54	<b>Sentence 6:</b> Of these forms, the most characteristic in Nahuatl is the juxtaposition of two words that, because they are synonyms, associated terms, or even contraries, complement each other to evoke one single idea.
3	49	<b>Choice B:</b> creations
4	48	<b>Choice D:</b> The first sums up the argument's position with regard to a certain hypothesis; the second provides grounds for that position.
5	57	<b>Choice A:</b> anachronistic; <b>Choice F:</b> alienated from
6	63	<b>Choice D:</b> invention
7	20	<b>Choice B:</b> lionization; <b>Choice D:</b> foreground
8	58	<b>Choice B:</b> aesthetics
9	69	<b>Choice C:</b> present evidence suggesting that singing has an important energy cost for certain birds
10	66	<b>Choice B:</b> Stores more energy as body reserves than on other days
11	65	<b>Sentence 9:</b> Thomas found that nightingales reached a significantly higher body mass at dusk and lost more mass overnight on nights when their song rate was high.
12	14	<b>Choice B:</b> They have generally received more attention from scientists.
13	86	<b>Choice A:</b> Many climbers, lulled into a false sense of security, use the new equipment to attempt climbing feats of which they are not capable.
14	46	<b>Choice B:</b> schism
15	10	<b>Choice D:</b> sartorial
16	36	<b>Choice A:</b> undemonstrative panache; <b>Choice F:</b> deflect
17	18	<b>Choice C:</b> strategic; <b>Choice D:</b> brandish; <b>Choice H:</b> deeply felt moral code
18	47	<b>Choice C:</b> provide an example of a way in which scholarship on the history of women in photography has been unsatisfactory
19	37	<b>Choice C:</b> In addition to providing a record of certain historical events, Marion Palfi's photographs played a role in subsequent events.
20	72	<b>Choice A:</b> exaggeration
21	24	<b>Choice A:</b> innocuous AND <b>Choice F:</b> benign
22	39	<b>Choice A:</b> antedated AND <b>Choice D:</b> preceded
23	61	<b>Choice B:</b> disparate AND <b>Choice C:</b> divergent
24	67	<b>Choice A:</b> arbitrary AND <b>Choice B:</b> capricious
25	85	<b>Choice C:</b> thrilled about AND <b>Choice E:</b> elated by

# Answer Key

## Section 4. Verbal Reasoning

<i>Question Number</i>	<i>P+</i>	<i>Correct Answer</i>
1	70	<b>Choice B:</b> fleeting AND <b>Choice C:</b> momentary
2	80	<b>Choice A:</b> diversity AND <b>Choice C:</b> variety
3	49	<b>Choice A:</b> synoptic AND <b>Choice B:</b> abridged
4	68	<b>Choice B:</b> intransigent AND <b>Choice F:</b> resolute
5	26	<b>Choice A:</b> A correct understanding of how phytoplankton photosynthesis utilizes carbon dioxide AND <b>Choice B:</b> A correct prediction about how the addition of iron to iron-poor waters would affect phytoplankton growth AND <b>Choice C:</b> An incorrect prediction about how phytoplankton growth would affect the concentration of atmospheric carbon dioxide
6	26	<b>Choice A:</b> help explain why Martin's hypothesis is incorrect
7	31	<b>Choice E:</b> There are fewer traffic accidents annually in Sparva than in any of the provinces of comparable or greater population.
8	23	<b>Choice A:</b> Voltaire's literary stature helped secure a large audience for this attempt to popularize Newton's ideas. AND <b>Choice B:</b> Voltaire's status as a nonscientist was an advantage in this effort to bring Newtonian science to the attention of the general public. AND <b>Choice C:</b> The frontispiece of the book implies that Voltaire's understanding of Newton's ideas was not achieved without assistance.
9	82	<b>Sentence 2:</b> In the book's frontispiece, Voltaire is seen writing at his desk, and over him a shaft of light from heaven, the light of truth, passes through Newton to Voltaire's collaborator Madame du Châtelet; she reflects that light onto the inspired Voltaire.
10	60	<b>Choice B:</b> extravagance; <b>Choice F:</b> profligate
11	37	<b>Choice B:</b> complacency; <b>Choice D:</b> embrace only a portion of the truth; <b>Choice G:</b> erroneous
12	35	<b>Choice D:</b> inform
13	43	<b>Choice E:</b> reconcile
14	54	<b>Choice C:</b> <i>The Quest of the Silver Fleece</i> has at least one feature that typically would attract the attention of literary scholars.
15	68	<b>Choice D:</b> DuBois' novels may eventually attract greater scholarly interest than they have to date
16	49	<b>Choice E:</b> The degree of consideration that has been given to DuBois' novels, including <i>The Quest of the Silver Fleece</i>
17	50	<b>Choice E:</b> an anomaly
18	19	<b>Choice A:</b> undermines; <b>Choice E:</b> inimical
19	54	<b>Choice A:</b> peculiarity; <b>Choice E:</b> assertive
20	23	<b>Choice B:</b> malignant; <b>Choice E:</b> insufficient; <b>Choice H:</b> benignity
21	53	<b>Choice B:</b> proximity to the Sun
22	59	<b>Choice C:</b> such a warm Arctic Ocean would trigger the melting of massive land-based glaciers in the Arctic

# Answer Key

<i>Question Number</i>	<i>P+</i>	<i>Correct Answer</i>
23	33	<b>Choice A:</b> Some of them offered a religious explanation for their immigration.
24	94	<b>Sentence 5:</b> When he moves beyond the principal actors, he finds that religious explanations were less frequently offered, and he concludes that most people immigrated because they were recruited by promises of material improvement.
25	64	<b>Choice A:</b> summarizing the findings of an investigation

## Section 5. Quantitative Reasoning

<i>Question Number</i>	<i>P+</i>	<i>Correct Answer</i>
1	65	<b>Choice B:</b> Quantity B is greater.
2	83	<b>Choice C:</b> The two quantities are equal.
3	62	<b>Choice D:</b> The relationship cannot be determined from the information given.
4	48	<b>Choice A:</b> Quantity A is greater.
5	47	<b>Choice D:</b> The relationship cannot be determined from the information given.
6	36	<b>Choice A:</b> Quantity A is greater.
7	26	<b>Choice C:</b> The two quantities are equal.
8	34	<b>Choice D:</b> The relationship cannot be determined from the information given.
9	46	<b>Choice B:</b> Quantity B is greater.
10	62	<b>Choice D:</b> 8 to 9
11	26	<b>Choice B:</b> 115
12	51	<b>121</b>
13	52	<b>Choice C:</b> 75
14	60	<b>Choice C:</b> 4,000
15	18	<b>Choice C:</b> The sales tax was less than \$0.45.
16	19	<b>Choice B:</b> Two
17	69	<b>Choice D:</b> 40
18	63	<b>9</b>
19	41	<b>Choice B:</b> 190
20	60	<b>Choice B:</b> Decaffeinated, instant, drip-brewed, percolated
21	70	<b>Choice A:</b> 2.5 and 3.0
22	35	<b>Choice D:</b> $2^{24}$
23	17	<b>Choice A:</b> $DBC$ is an equilateral triangle. AND <b>Choice D:</b> The length of $BC$ is 10.
24	51	<b>18</b>
25	34	<b>Choice C:</b> 35.0

# Answer Key

## Section 6. Quantitative Reasoning

<i>Question Number</i>	<i>P+</i>	<i>Correct Answer</i>
1	66	<b>Choice A:</b> Quantity A is greater.
2	73	<b>Choice D:</b> The relationship cannot be determined from the information given.
3	52	<b>Choice A:</b> Quantity A is greater.
4	46	<b>Choice C:</b> The two quantities are equal.
5	48	<b>Choice B:</b> Quantity B is greater.
6	33	<b>Choice C:</b> The two quantities are equal.
7	40	<b>Choice D:</b> The relationship cannot be determined from the information given.
8	26	<b>Choice B:</b> Quantity B is greater.
9	31	<b>Choice D:</b> The relationship cannot be determined from the information given.
10	67	<b>Choice A:</b> \$40.00
11	10	<b>Choice A:</b> The $x$ -intercept of line $k$ is twice the $y$ -intercept of line $k$ . AND <b>Choice B:</b> The product of the $x$ -intercept and the $y$ -intercept of line $k$ is positive. AND <b>Choice C:</b> Line $k$ passes through the points $(a, b)$ and $(r, s)$ , where $(a - r)(b - s) < 0$ .
12	49	<b>Choice B:</b> 3:30
13	27	<b>Choice E:</b> The fifth-lowest salary in the second quartile
14	38	<b>13</b>
15	40	<b>Choice E:</b> $m$ is an even integer.
16	21	<b>Choice A:</b> $81v$ AND <b>Choice B:</b> $25v + 10\sqrt{v} + 1$
17	79	<b>Choice B:</b> 47
18	44	<b>Choice A:</b> 130
19	41	<b>Choice A:</b> 50
20	30	<b>Choice C:</b> 38%
21	11	<b>Choice E:</b> 58
22	58	<b>Choice D:</b> $\frac{1}{b} < 1 < \frac{1}{a}$
23	24	<b>Choice B:</b> $\frac{\sqrt{3}}{2}r^2$
24	15	<b><math>\frac{153}{190}</math></b> (or any equivalent fraction)
25	30	<b>Choice E:</b> 304