

**Math Test**  
**Time—30 Minutes**  
**20 Questions**

**This test is composed of both problem solving questions and data sufficiency questions.**

**Problem Solving Directions:** Solve each problem and choose the best of the answer choices provided.

**Data Sufficiency Directions:** Each data sufficiency problem consists of a question and two statements, labeled (1) and (2), which contain certain data. Using these data and your knowledge of mathematics and everyday facts (such as the number of days in July or the meaning of *counterclockwise*), decide whether the data given are sufficient for answering the question and then indicate one of the following answer choices:

- (A) Statement (1) ALONE is sufficient, but statement (2) alone is not sufficient.
  - (B) Statement (2) ALONE is sufficient, but statement (1) alone is not sufficient.
  - (C) BOTH statements TOGETHER are sufficient, but NEITHER statement ALONE is sufficient.
  - (D) EACH statement ALONE is sufficient.
  - (E) Statements (1) and (2) TOGETHER are not sufficient.
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1. If  $(16)(3^2) = x(2^3)$ , then  $x =$

- (A) 81
- (B) 72
- (C) 18
- (D) 16
- (E) 8

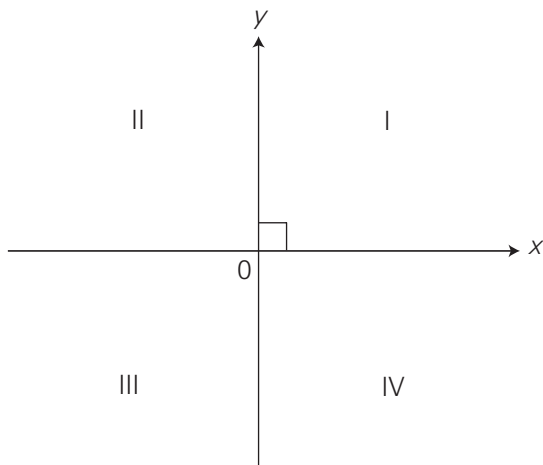
2. By how many dollars is the price of a computer reduced during a sale?

- (1) The price of the computer is reduced by 25% during the sale.
  - (2) The sale price of the computer is \$36.
- (A) Statement (1) ALONE is sufficient, but statement (2) alone is not sufficient.
  - (B) Statement (2) ALONE is sufficient, but statement (1) alone is not sufficient.
  - (C) BOTH statements TOGETHER are sufficient, but NEITHER statement ALONE is sufficient.
  - (D) EACH statement ALONE is sufficient.
  - (E) Statements (1) and (2) TOGETHER are not sufficient.

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3. Of the 720 players who participated in a softball tournament, 65 percent traveled more than 200 miles to play. What is the difference between the number of participants who traveled more than 200 miles and the number of participants who traveled 200 miles or less?
- (A) 108  
(B) 216  
(C) 252  
(D) 468  
(E) 655
4. If  $r - s = 240$ , does  $r = 320$  ?
- (1)  $r = 4s$   
(2)  $s = 80$
- (A) Statement (1) ALONE is sufficient, but statement (2) alone is not sufficient.  
(B) Statement (2) ALONE is sufficient, but statement (1) alone is not sufficient.  
(C) BOTH statements TOGETHER are sufficient, but NEITHER statement ALONE is sufficient.  
(D) EACH statement ALONE is sufficient.  
(E) Statements (1) and (2) TOGETHER are not sufficient.
5. If a heavy-load trailer travels 7 miles in 1 hour and 10 minutes, what is its speed in miles per hour?
- (A) 6  
(B) 6.5  
(C) 8  
(D) 8.5  
(E) 10
6. If Bob purchases 18 cans of soda, how many of the cans are diet soda?
- (1) The number of diet soda cans Bob purchases is equal to the number that are not diet soda.  
(2) Bob purchases an odd number of cans of diet soda.
- (A) Statement (1) ALONE is sufficient, but statement (2) alone is not sufficient.  
(B) Statement (2) ALONE is sufficient, but statement (1) alone is not sufficient.  
(C) BOTH statements TOGETHER are sufficient, but NEITHER statement ALONE is sufficient.  
(D) EACH statement ALONE is sufficient.  
(E) Statements (1) and (2) TOGETHER are not sufficient.
7. If  $y$  is an odd integer, which of the following must be an even integer?
- (A)  $y + 2$   
(B)  $y + 6$   
(C)  $2y - 1$   
(D)  $3y$   
(E)  $3y + 1$
8. At Perry High School, the ratio of students who participate in either the band program or the choral program to students who participate in neither program is 3 to 8. If 220 students attend Perry High School, how many of them participate in neither program?
- (A) 40  
(B) 60  
(C) 100  
(D) 160  
(E) 180

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9. The quadrants of the  $xy$ -plane are shown in the figure above. Does line  $d$  (not shown) pass through Quadrant III ?

- (1) Line  $d$  has a negative  $x$ -intercept.
  - (2) Line  $f$ , which is parallel to line  $d$ , has a negative  $y$ -intercept.
- (A) Statement (1) ALONE is sufficient, but statement (2) alone is not sufficient.
  - (B) Statement (2) ALONE is sufficient, but statement (1) alone is not sufficient.
  - (C) BOTH statements TOGETHER are sufficient, but NEITHER statement ALONE is sufficient.
  - (D) EACH statement ALONE is sufficient.
  - (E) Statements (1) and (2) TOGETHER are not sufficient.

10. A \$240 interest-free loan is to be paid back in equal monthly payments. If a total of  $2\frac{1}{2}$  percent of the original amount of the loan is paid back every 6 months, then how many months will it take to pay back \$21.00 ?

- (A) 6
- (B) 7
- (C) 18
- (D) 21
- (E) 24

11. If  $x$  and  $y$  are positive integers, is  $x$  a factor of 12 ?

- (1)  $xy$  is a factor of 12.
  - (2)  $y = 3$
- (A) Statement (1) ALONE is sufficient, but statement (2) alone is not sufficient.
  - (B) Statement (2) ALONE is sufficient, but statement (1) alone is not sufficient.
  - (C) BOTH statements TOGETHER are sufficient, but NEITHER statement ALONE is sufficient.
  - (D) EACH statement ALONE is sufficient.
  - (E) Statements (1) and (2) TOGETHER are not sufficient.

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12. If a zebra can only get water from either a stream or a pond, which of the two sources of water is closer to the zebra's current position?
- (1) Moving at a constant rate from its current position, the zebra reaches the stream in 2 hours.  
(2) Moving at a constant rate from the stream, the zebra takes 2 hours to reach the pond.
- (A) Statement (1) ALONE is sufficient, but statement (2) alone is not sufficient.  
(B) Statement (2) ALONE is sufficient, but statement (1) alone is not sufficient.  
(C) BOTH statements TOGETHER are sufficient, but NEITHER statement ALONE is sufficient.  
(D) EACH statement ALONE is sufficient.  
(E) Statements (1) and (2) TOGETHER are not sufficient.
13. What is the value of  $x^2 - y^2$ ?
- (1)  $x - y = 0$   
(2)  $x + y = 4$
- (A) Statement (1) ALONE is sufficient, but statement (2) alone is not sufficient.  
(B) Statement (2) ALONE is sufficient, but statement (1) alone is not sufficient.  
(C) BOTH statements TOGETHER are sufficient, but NEITHER statement ALONE is sufficient.  
(D) EACH statement ALONE is sufficient.  
(E) Statements (1) and (2) TOGETHER are not sufficient.
14. If the remainder when a certain integer  $x$  is divided by 5 is 2, then each of the following could also be an integer, EXCEPT
- (A)  $\frac{x}{17}$   
(B)  $\frac{x}{11}$   
(C)  $\frac{x}{10}$   
(D)  $\frac{x}{6}$   
(E)  $\frac{x}{3}$
15. A mixture of ground meat consists of 2 pounds of veal that costs  $x$  dollars per pound, and 5 pounds of beef that costs  $y$  dollars per pound. What is the cost of the mixture in dollars per pound?
- (A)  $2x + 5y$   
(B)  $\frac{2x + 5y}{xy}$   
(C)  $5(2x + 5y)$   
(D)  $x + y$   
(E)  $\frac{2x + 5y}{7}$

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16. Is  $0 < y < 1$  ?
- (1)  $0 < \sqrt{y} < 1$
- (2)  $y^2 = \frac{1}{4}$
- (A) Statement (1) ALONE is sufficient, but statement (2) alone is not sufficient.
- (B) Statement (2) ALONE is sufficient, but statement (1) alone is not sufficient.
- (C) BOTH statements TOGETHER are sufficient, but NEITHER statement ALONE is sufficient.
- (D) EACH statement ALONE is sufficient.
- (E) Statements (1) and (2) TOGETHER are not sufficient.

17. If  $a$  and  $b$  are positive integers, is  $ab$  odd?
- (1)  $b = 3$
- (2)  $a$  and  $b$  are consecutive integers.
- (A) Statement (1) ALONE is sufficient, but statement (2) alone is not sufficient.
- (B) Statement (2) ALONE is sufficient, but statement (1) alone is not sufficient.
- (C) BOTH statements TOGETHER are sufficient, but NEITHER statement ALONE is sufficient.
- (D) EACH statement ALONE is sufficient.
- (E) Statements (1) and (2) TOGETHER are not sufficient.

18. Last year, an appliance store sold an average (arithmetic mean) of 42 microwave ovens per month. In the first 10 months of this year, the store sold an average of only 20 microwaves per month. What is the average number of microwaves sold per month for the entire 22-month period?
- (A) 21
- (B) 30
- (C) 31
- (D) 32
- (E) 44

19. If  $AB$  is the diameter of the circle with center  $X$  and  $C$  is a point on the circle such that  $AC = AX = 3$ , what is the perimeter of triangle  $ABC$  ?
- (A)  $\frac{9\sqrt{3}}{2}$
- (B) 9
- (C)  $6 + 3\sqrt{3}$
- (D)  $9 + 3\sqrt{3}$
- (E)  $9\sqrt{3}$

**ADVANCE PURCHASE DISCOUNTS FOR AIRLINE TRAVEL**

Days Prior to Departure	Percentage Discount
0–6 days	0%
7–13 days	10%
14–29 days	25%
30 days or more	40%

20. The table above shows the discount structure for advance purchase of tickets at a particular airline. A passenger bought a ticket at this airline for \$1,050. Had she purchased the ticket one day later, she would have paid \$210 more. How many days before her departure did she purchase her ticket?
- (A) 6 days
- (B) 7 days
- (C) 13 days
- (D) 14 days
- (E) 29 days

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**Verbal Test**  
**Time—30 Minutes**  
**20 Questions**

**This test is made up of sentence correction, critical reasoning, and reading comprehension questions.**

**Sentence Correction Directions:** Each of the sentence correction questions presents a sentence, part or all of which is underlined. Beneath the sentence you will find five ways of phrasing the underlined part. The first of these repeats the original; the other four are different. Follow the requirements of standard written English to choose your answer, paying attention to grammar, word choice, and sentence construction. Select the answer that produces the most effective sentence; your answer should make the sentence clear, exact, and free of grammatical errors. It should also minimize awkwardness, ambiguity, and redundancy.

**Reading Comprehension Directions:** Each of the reading comprehension questions is based on the content of a passage. After reading the passage, answer all questions pertaining to it on the basis of what is stated or implied in the passage. For each question, select the best answer of the choices given.

**Critical Reasoning Directions:** Each of the critical reasoning questions is based on a short argument, a set of statements, or a plan of action. For each question, select the best answer of the choices given.

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21. Unseasonable weather in the months before a wine harvest can cool vineyards in the Bordeaux region enough to affect the overall size of the grapes themselves, create unwanted moisture that can cause mold in some grape varieties and deterioration in others.
- (A) to affect the overall size of the grapes themselves, create  
(B) to affect the overall size of the grapes themselves and create  
(C) that the overall size of the grapes themselves are affected, create  
(D) that it affects the overall size of the grapes themselves, creates  
(E) that the size of the grapes are affected and creates
22. It is posited by some scientists that the near extinction of the sap-eating gray bat of northwestern America was caused by government-sponsored logging operations in the early 1920s that greatly reduced the species' habitat.
- Which of the following, if true, most strongly weakens the scientists' claims?
- (A) Logging operations in the 1920s are widely held responsible for the near extinction of other species that lived in the same area.  
(B) A boom in new home construction in the early 1920s led congress to open federal lands to logging operations.  
(C) A 5-year drought in the early 1920s severely reduced the output of sap in trees in northwestern America.  
(D) Numbers of sightings of sap-eating gray bats fell to their lowest numbers in 1926.  
(E) Sightings of sap-eating gray bats in Europe stayed roughly the same during the same period.

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23. Upset by the recent downturn in production numbers during the first half of the year, the possibility of adding worker incentives was raised by the board of directors at its quarterly meeting.
- (A) the possibility of adding worker incentives was raised by the board of directors at its quarterly meeting
  - (B) the addition of worker incentives was raised as a possibility by the board of directors at its quarterly meeting
  - (C) added worker incentives was raised by the board of directors at its quarterly meeting as a possibility
  - (D) the board of directors raised at its quarterly meeting the possibility of worker incentives being added
  - (E) the board of directors, at its quarterly meeting, raised the possibility of adding worker incentives

24. Whenever a major airplane accident occurs, there is a dramatic increase in the number of airplane mishaps reported in the media, a phenomenon that may last for as long as a few months after the accident. Airline officials assert that the publicity given the gruesomeness of major airplane accidents focuses media attention on the airline industry, and the increase in the number of reported accidents is caused by an increase in the number of news sources covering airline accidents, not by an increase in the number of accidents.

Which of the following, if true, would seriously weaken the assertions of the airline officials?

- (A) The publicity surrounding airline accidents is largely limited to the country in which the crash occurred.
- (B) Airline accidents tend to occur far more often during certain peak travel months.
- (C) Media organizations do not have any guidelines to help them decide how severe an accident must be for it to receive coverage.
- (D) Airplane accidents receive coverage by news sources only when the news sources find it advantageous to do so.
- (E) Studies by government regulators show that the number of airplane flight miles remains relatively constant from month to month.

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Questions 25–28 are based on the following passage:

The function of strategic planning is to position a company for long-term growth and expansion in a variety of markets by analyzing its strengths and weaknesses and examining current and  
Line (5) potential opportunities. Based on this information, the company develops a strategy for itself.

That strategy becomes the basis for supporting strategies for the company’s various departments.

This implementation strategy is where all too  
(10) many strategic plans go astray. Recent business management surveys show that most CEOs who have a strategic plan are concerned with the potential breakdown in the implementation of the plan. Unlike corporations in the 1980s that blindly  
(15) followed their 5-year plans, even when they were misguided, today’s corporations tend to second-guess their long-term plans.

Outsiders can help facilitate the process, but in the final analysis, if the company does not make  
(20) the plan, the company will not follow the plan. This was one of the problems with strategic planning in the 1980s. In that era, strategic planning was an abstract, top-down process involving only a few top corporate officers and hired guns. Number  
(25) crunching experts came into a company and generated tome-like volumes filled with a mixture of abstruse facts and grand theories that had little to do with the day-to-day realities of the company. Key middle managers were left out of planning  
(30) sessions, resulting in lost opportunities and ruffled feelings.

However, more hands-on strategic planning can produce startling results. A recent survey queried more than a thousand small- to medium-sized  
(35) businesses to compare companies with a strategic plan to companies without one. The survey found that companies with strategic plans had annual revenue growth of 6.2 percent as opposed to 3.8 percent for the other companies.

Perhaps most important, a strategic plan helps companies anticipate—and survive—change. New technology and the mobility of capital means that markets can shift faster than ever before. Some financial analysts wonder why companies  
(45) should bother planning two years ahead when market dynamics might be transformed by next quarter. However, it is this pace of change that makes planning so crucial. Now, more than ever, companies have to stay alert to the marketplace.

(50) In an environment of continual and rapid change, long-range planning expands options and organizational flexibility.

25. The primary purpose of the passage is to
- (A) refute the idea that change is bad for a corporation’s long-term health
  - (B) describe how long-term planning, despite some potential pitfalls, can help a corporation to grow
  - (C) compare and contrast two styles of corporate planning
  - (D) evaluate the strategic planning goals of corporate America today
  - (E) defend a methodology that has come under sharp attack
26. It can be inferred from the passage that strategic planning during the 1980s had all of the following shortcomings EXCEPT
- (A) a reliance on outside consultants who did not necessarily understand the nuts and bolts of the business
  - (B) a dependence on theoretical models that did not always perfectly describe the workings of the company
  - (C) an inherent weakness in the company’s own ability to implement the strategic plan
  - (D) an excess of information and data that made it difficult to get to key concepts
  - (E) the lack of a forum for middle managers to express their ideas

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27. The author most likely mentions the results of the survey of 1,000 companies in order to
- (A) put forth an opposing view on strategic plans which is later refuted
  - (B) illustrate that when strategic planning is “hands-on,” it produces uninspiring results
  - (C) give a concrete example of why strategic planning did not work during the 1980s
  - (D) support the contention that strategic planning can be very successful when done correctly
  - (E) give supporting data to prove that many companies have implemented strategic plans
28. The passage suggests which of the following about the “financial analysts” mentioned in lines 44–47 ?
- (A) They believe that strategic planning is the key to weathering the rapid changes of the marketplace.
  - (B) They are working to understand and anticipate market developments that are two years ahead.
  - (C) Their study of market dynamics has led them to question the reliability of short-term planning strategies.
  - (D) They might not agree with the author that one way to survive rapidly changing conditions comes from long-range planning.
  - (E) They consider the mobility of capital to be a necessary condition for the growth of new technology.
29. The Internal Revenue Service has directed that taxpayers who generate no self-employment income can no longer deduct home offices, home office expenses, or nothing that was already depreciated as a business expense the previous year.
- (A) or nothing that was already
  - (B) or that was already
  - (C) or anything that was already
  - (D) and anything
  - (E) and nothing that already was
30. Informed people generally assimilate information from several divergent sources before coming to an opinion. However, most popular news organizations view foreign affairs solely through the eyes of our State Department. In reporting the political crisis in a foreign country, news organizations must endeavor to find alternative sources of information.
- Which of the following inferences can be drawn from the argument above?
- (A) To the degree that a news source gives an account of another country that mirrors that of our State Department, that reporting is suspect.
  - (B) To protect their integrity, news media should avoid the influence of State Department releases in their coverage of foreign affairs.
  - (C) Reporting that is not influenced by the State Department is usually more accurate than are other accounts.
  - (D) The alternative sources of information mentioned in the passage might not share the same views as the State Department.
  - (E) A report cannot be seen as influenced by the State Department if it accurately depicts the events in a foreign country.

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31. When automatic teller machines were first installed in the 1980s, bank officials promised they would be faster, more reliable, and less prone to make errors than their human counterparts.
- (A) they would be faster, more reliable, and less prone to make errors
  - (B) they would be faster, more reliable, and that they would be less prone for making errors
  - (C) the machines would be faster, more reliable, and less prone to errors
  - (D) the machines were faster, more reliable, and errors would occur much less
  - (E) faster, more reliable machines, and that errors would be less prone
32. With its plan to create a wildlife sanctuary out of previously unused landfill, Sweden is but one of a number of industrialized nations that is accepting its responsibility to protect endangered species and promote conservation.
- (A) is accepting its responsibility to protect endangered species and promote
  - (B) is accepting its responsibility for protecting endangered species and promoting
  - (C) are accepting its responsibility to protect endangered species and promoting
  - (D) are accepting of their responsibility to protect endangered species and to promote
  - (E) are accepting their responsibility to protect endangered species and promote
33. A decade after a logging operation in India began cutting down trees in a territory that serves as a sanctuary for Bengal tigers, the incidence of tigers attacking humans in nearby villages has increased by 300 percent. Because the logging operation has reduced the number of acres of woodland per tiger on average from 15 acres to approximately 12 acres, scientists have theorized that tigers must need a minimum number of acres of woodland in order to remain content.
- Which of the following statements, if true, would most strengthen the scientists' hypothesis?
- (A) In other wildlife areas in India where the number of acres of woodland per tiger remains at least 15 acres, there has been no increase in the number of tiger attacks on humans.
  - (B) Before the logging operation began, there were many fewer humans living in the area.
  - (C) The largest number of acres per tiger before the logging operation began was 32 acres per tiger in one area of the sanctuary, whereas the smallest number of acres per tiger after the logging operation was 9 acres.
  - (D) Other species of wild animals have begun competing with the Bengal tigers for the dwindling food supply.
  - (E) The Bengal tiger has become completely extinct in other areas of Asia.

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34. The machine press union and company management were not able to communicate effectively, and it was a major cause of the 1999 strike in Seattle.

- (A) The machine press union and company management were not able to communicate effectively, and it
- (B) Communications between the machine press union and company management were not effective, and it
- (C) For the machine press union and company management, to be unable to communicate effectively
- (D) The inability of the machine press union and company management to communicate effectively
- (E) The machine press union, being unable to communicate effectively with company management,

35. A greater number of fresh vegetables are sold in City *X* than in City *Y*. Therefore, the people in City *X* have better nutritional habits than those in City *Y*.

Each of the following, if true, weakens the conclusion above EXCEPT:

- (A) City *X* has more people living in it than City *Y*.
- (B) Most of the people in City *Y* work in City *X* and buy their vegetables there.
- (C) The people in City *X* buy many of their vegetables as decorations, not to eat.
- (D) The per capita consumption of junk food in City *X* is three times that of City *Y*.
- (E) The average price per pound of vegetables in City *Y* is lower than the average price per pound of vegetables in City *X*.

36. Heavy metals, toxic waste by-products that can cause tumors in fish, are generally found in the waters off industrial shorelines, but have been discovered in trace amounts even in the relatively pristine waters of the South Pacific.

- (A) are generally found in the waters off industrial shorelines, but have been discovered in trace amounts even
- (B) are generally to be found in the waters off industrial shorelines, and have even been discovered in trace amounts
- (C) can, in general, be found in the waters off industrial shorelines, and have been discovered in trace amounts even
- (D) had generally been found in the waters off industrial shorelines, but have even been discovered in trace amounts
- (E) are found generally in the waters off industrial shorelines, but have been discovered in a trace amount even

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Questions 37–40 are based on the following passage:

In Roman times, defeated enemies were generally put to death as criminals for having offended the emperor of Rome. In the Middle Ages, however, the practice of ransoming, or returning prisoners in exchange for money, became common. Though some saw this custom as a step toward a more humane society, the primary reasons behind it were economic rather than humanitarian.

(10) In those times, rulers had only a limited ability to raise taxes. They could neither force their subjects to fight nor pay them to do so. The promise of material compensation in the form of goods and ransom was therefore the only way of inducing combatants to participate in a war. In the Middle Ages, the predominant incentive for the individual soldier was the expectation of spoils. Although collecting ransom clearly brought financial gain, keeping a prisoner and arranging for his exchange had its costs. Consequently, procedures were devised to reduce transaction costs.

One such device was a rule asserting that the prisoner had to assess his own value. This compelled the prisoner to establish a value without too much distortion; indicating too low a value would increase the captive's chances of being killed, while indicating too high a value would either ruin him financially or create a prohibitively expensive ransom that would also result in death.

37. The primary purpose of the passage is to
- (A) discuss the economic basis of the medieval practice of exchanging prisoners for ransom
  - (B) examine the history of the treatment of prisoners of war
  - (C) emphasize the importance of a warrior's code of honor during the Middle Ages
  - (D) explore a way of reducing the costs of ransom
  - (E) demonstrate why warriors of the Middle Ages looked forward to battles
38. It can be inferred from the passage that a medieval soldier
- (A) was less likely to kill captured members of opposing armies than was a soldier of the Roman Empire
  - (B) operated on a basically independent level and was motivated solely by economic incentives
  - (C) had few economic options and chose to fight because it was the only way to earn an adequate living
  - (D) was motivated to spare prisoners' lives by humanitarian rather than economic ideals
  - (E) had no respect for his captured enemies since captives were typically regarded as weak

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39. Which of the following best describes the change in policy from executing prisoners in Roman times to ransoming prisoners in the Middle Ages?
- (A) The emperors of Rome demanded more respect than did medieval rulers, and thus Roman subjects went to greater lengths to defend their nation.
  - (B) It was a reflection of the lesser degree of direct control medieval rulers had over their subjects.
  - (C) It became a show of strength and honor for warriors of the Middle Ages to be able to capture and return their enemies.
  - (D) Medieval soldiers were not as humanitarian as their ransoming practices might have indicated.
  - (E) Medieval soldiers demonstrated more concern about economic policy than did their Roman counterparts.
40. The author uses the phrase “without too much distortion” (lines 24–25) in order to
- (A) indicate that prisoners would fairly assess their worth
  - (B) emphasize the important role medieval prisoners played in determining whether they should be ransomed
  - (C) explain how prisoners often paid more than an appropriate ransom in order to increase their chances for survival
  - (D) suggest that captors and captives often had understanding relationships
  - (E) show that when in prison a soldier’s view could become distorted

## END OF WARM-UP TEST