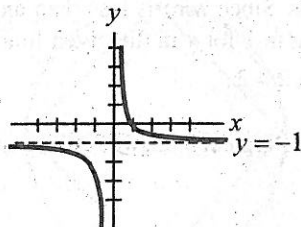


57. (B) (p. 500) *Mathematics/Algebra/Expressing and Evaluating Algebraic Functions/Concepts of Domain and Range.* The domain of a function is the set of all possible x values; the range of a function is the set of all possible y values. Sketch a graph of the function (or use a graphing calculator):



From the graph, it is obvious that the y -values both approach, but never actually reach, -1 . Therefore, the range is defined by all real numbers except -1 .

Alternatively, this item can be solved algebraically by solving for x . Since $f(x) = \frac{1-x}{x}$, $x[f(x)] = 1-x \Rightarrow x[f(x)] + x = 1 \Rightarrow x[f(x)+1] = 1 \Rightarrow x = \frac{1}{f(x)+1}$. The range of the function is the set of all possible values for $f(x)$. Since division by zero is undefined, $f(x)+1 \neq 0 \Rightarrow f(x) \neq -1$. Thus, $f(x)$ can be any value except -1 .

58. (K) (p. 500) *Mathematics/Trigonometry/Trigonometric Relationships.* $x = 3(\sin \theta)$ and $y = 2(\cos \theta)$; thus, $\sin \theta = \frac{x}{3}$ and $\cos \theta = \frac{y}{2}$. $\sin^2 \theta + \cos^2 \theta = 1$; thus, $\left(\frac{x}{3}\right)^2 + \left(\frac{y}{2}\right)^2 = 1 \Rightarrow \frac{x^2}{9} + \frac{y^2}{4} = 1$ is the equation of an ellipse with center $(0,0)$ that passes through the points $(3,0)$ and $(0,2)$.

Alternatively, plug in values for θ . For $\theta = 0$, $x = 3[\sin(0)] = 3(0) = 0$. For $\theta = \frac{\pi}{2}$, $x = 3\left(\sin \frac{\pi}{2}\right) = 3(1) = 3$ and $y = 2\left(\cos \frac{\pi}{2}\right) = 2(0) = 0$. Therefore, the graph must include the points $(3,0)$ and $(0,2)$. The only graph given that contains both of these points is (K).

59. (A) (p. 500) *Mathematics/Trigonometry/Definitions of the Six Trigonometric Functions.* Sine and cosecant are reciprocal functions, so the product of the sine of any angle and the cosecant of that angle is 1. This fact can quickly be derived from the definitions of sine and cosecant. Given a triangle with sides a and b and hypotenuse c , let θ be opposite side b . $\sin \theta = \frac{b}{c}$ and $\csc \theta = \frac{c}{b}$. Therefore, $\sin \theta \cdot \csc \theta = 1$.
60. (J) (p. 501) *Mathematics/Trigonometry/Trigonometry as an Alternative Method of Solution.* There are several different ways of expressing the length of \overline{BC} : as a number, as a function of $\angle ACB$, and as a function of $\angle CAB$. "Testing-the-test" is the easiest option, and some exam wisdom will help. First, do not fall for (F) or (G). Test-takers are not expected to know values of trigonometric functions at particular angles. Since 40° and 50° are not easily remembered values, the answer is not going to be 4 or 5. The answer will be expressed using a trigonometric function. (J) is correct: $\tan A = \frac{\overline{BC}}{\overline{AB}} \Rightarrow \overline{BC} = \overline{AB}(\tan A) = 3(\tan 50^\circ)$.

Section 3: Reading

1. (D) (p. 503) *Reading/Prose Fiction/Implied Idea.* In the final paragraph, the young man, Robin, is trying to explain to himself why the barbers laughed at him. Thus, he is talking to himself.

2. (J) (p. 503) *Reading/Prose Fiction/Explicit Detail*. The five shillings was not enough to satisfy the ferryman for having to make a special trip. The young man was forced to pay an additional three pence, bringing the total fare to five shillings and three pence.
3. (B) (p. 503) *Reading/Prose Fiction/Implied Idea*. Just after the young man gets off the ferryboat, he finds himself in a neighborhood of hovels and old houses that, he concludes, could not belong to his relative. Therefore, the young man must think his relative is well-to-do.
4. (J) (p. 503) *Reading/Prose Fiction/Implied Idea*. The scene is at night: the boat crosses at nine o'clock in the evening, the lights are on in the barber shop, and the stranger in the coat threatens to have the young man put in the stocks by morning.
5. (A) (p. 503) *Reading/Prose Fiction/Implied Idea*. In the first paragraph, the narrator remarks that the young man sets off on foot with a light step—as though he had not already traveled more than 30 miles. Thus, 30 miles is a long way to travel in a day.
6. (G) (p. 503) *Reading/Prose Fiction/Explicit Detail*. The young man finally concludes that the barbers laugh at him for approaching the stranger in the coat because it should have been obvious to him that the stranger in the coat would not know the Major.
7. (A) (p. 503) *Reading/Prose Fiction/Implied Idea*. The currency used to pay the ferryman and the length of a day's journey is suggestive. The reference to a "New England colony" clearly places the action some time before the end of the eighteenth century.
8. (F) (p. 503) *Reading/Prose Fiction/Implied Idea*. The young man bows to the stranger and addresses him as "honored sir" in order to show respect.
9. (B) (p. 503) *Reading/Prose Fiction/Implied Idea*. The passage states that nine o'clock in the evening was an "unusual hour." Such language implies that nine o'clock was an unusual time for anyone to be using the ferryboat. This is why the young man was its only passenger. Eliminate (A) because the ferry trip was not a private charter.
10. (F) (p. 503) *Reading/Prose Fiction/Implied Idea*. The phrase "small and mean wooden buildings" characterizes the neighborhood near the ferry landing. The next paragraph also mentions a hovel and an old house.
11. (B) (p. 504) *Reading/Social Science/Explicit Detail*. As stated in the last paragraph of the passage, Turner's essay challenged the traditional approach of Eastern historians. That reference refers to the views of other American historians of his time.
12. (F) (p. 504) *Reading/Social Science/Explicit Detail*. The final paragraph shows that (F) is the correct answer. Turner was the first historian to use the techniques of the social sciences to formulate and investigate historical questions. He studied the effects of economic, geographical, and sociological factors on the settlement of the American West. In addition, Turner redirected the focus of historical inquiry away from politics and political leaders, centering it instead on the lives of people in a national setting. In doing so, Turner identified what he considered to be the attributes of the American character.
13. (D) (p. 504) *Reading/Social Science/Explicit Detail*. As noted in the third paragraph of the passage, Turner's evidence for the disappearance of the American frontier drew on the census of 1880.
14. (J) (p. 505) *Reading/Social Science/Explicit Detail*. As stated in the first paragraph of the passage, Turner's essay affected the subsequent direction and methodology of inquiry in American history.
15. (C) (p. 505) *Reading/Social Science/Application*. The fact that much of the land in the West and Midwest was bought by wealthy land speculators from the East cast doubt on Turner's view that the West was settled by individuals looking to escape from the pressure of city life in the East.

16. (F) (p. 505) *Reading/Social Science/Application*. Turner's theory was that the West served as a safety-valve by providing a means for the dissipation of social dissatisfaction stemming from the frustration of city life. However, if demographic data showed that more people actually left the farms for the cities than left the cities for the frontier, this theory would no longer be valid.
17. (C) (p. 505) *Reading/Social Science/Vocabulary*. A theory can be defined as a hypothesis that contains an assumed explanation of a large number of isolated facts. It can be tested and thus can be proved or disproved.
18. (H) (p. 505) *Reading/Social Science/Explicit Detail*. The frontier line of America moved from the East, where the first English colonies were founded, to the West, where the last settlements were established.
19. (D) (p. 505) *Reading/Social Science/Explicit Detail*. In the fourth paragraph, Turner claimed that "settlers no longer depended on England for goods but had become self-sufficient." "Self-sufficient" indicates that needed goods were bought in America.
20. (G) (p. 505) *Reading/Social Science/Application*. As stated in the last paragraph of the passage, before Turner turned his attention to studying the people and the settlements of the American frontier, American historians had restricted the boundaries of American history to the history of politics and the roles played by past American political leaders.
21. (A) (p. 506) *Reading/Humanities/Development*. At the end of the first paragraph, the author raises a question, which he then proceeds to answer. (A) describes this development. (B) is incorrect because the author does not present a theory as such. A theory is a hypothetical explanation of phenomena; the author instead presents his viewpoint about what is important in life. Also, while the author offers many opinions, none "prove" his viewpoint. As for (C), the author does not contrast his own views with other views. As for (D), the author does not define a term.
22. (J) (p. 506) *Reading/Humanities/Vocabulary*. In the final paragraph, the author explains that life is much too short. The author introduces the discussion by stating that experience is the end or goal of life—to get the most out of life, one must pack it with "as many pulsations as possible." One can infer that the author means experiences.
23. (B) (p. 506) *Reading/Humanities/Explicit Detail*. The discussion of art is found in the closing sentences of the passage. Having said that the best life is one packed with experiences (pulsations), the author goes on to say how one can have these intense experiences. This is one function of art, he says—to do nothing but provoke feelings—not to depict reality, (A); not to encourage reform, (C); not as a means of expression, (D).
24. (H) (p. 506) *Reading/Humanities/Application*. Experience is everything according to the author, so he would probably agree with (H). It is the feeling of the moment that is important, not the memory of the feeling. Once the feeling is past, you should be looking for new feelings, not thinking about past ones.
25. (A) (p. 506) *Reading/Humanities/Voice*. The writing is highly impassioned. The intensity of the writing is evident in every sentence. The issues are those of life and death. The author uses phrases such as "passionate attitude," "tragic dividing," "awful brevity," and "splendor of our experience."
26. (H) (p. 507) *Reading/Humanities/Implied Idea*. In the second paragraph, the author argues that the best life is one filled with experiences of every sort. Not to seek after a variety of experiences is, in the author's words, "on this short day of the frost and sun, to sleep before evening." The phrase "to sleep before evening" must mean to stop living even before death. Thus, the "short day of the frost and sun" refers to a person's life.
27. (C) (p. 507) *Reading/Humanities/Implied Idea*. The author emphasizes the importance of living life to the fullest. In line 26, "awful brevity" refers to the shortness of life.

28. (J) (p. 507) *Reading/Humanities/Explicit Detail*. In the final paragraph, the author contrasts those who are listless with those who are the children of the world. The children of the world are high in passion, wise, and in love with art and song.
29. (A) (p. 507) *Reading/Humanities/Implied Idea*. Lines 36–42 say that the desire for beauty has the most power to quicken our sense of life.
30. (H) (p. 507) *Reading/Humanities/Implied Idea*. The author says that we are all under a sentence of death with an indefinite reprieve, meaning that we are all mortal. We have an “interval,” meaning our life; and then “our place knows us no more,” meaning we are gone from the earth; that is, we are dead.
31. (B) (p. 509) *Reading/Natural Science/Explicit Detail*. Line 3 reads, in part: “energy, which is the capacity for doing work.”
32. (H) (p. 509) *Reading/Natural Science/Explicit Detail*. The second paragraph states that the result of the process is a mix of sugar and oxygen. O_2 names oxygen, and H_2O names water, so $C_6H_{12}O_6$ names a sugar.
33. (A) (p. 509) *Reading/Natural Science/Explicit Detail*. Lines 17–21 define both terms. Reduction is the addition of electrons, and oxidation is the removal of electrons.
34. (J) (p. 509) *Reading/Natural Science/Explicit Detail*. Lines 17–19 state that photosynthesis involves the addition of electrons, making (I) correct. Lines 23–26 state that photosynthesis involves action on hydrogen, meaning that (II) is also correct. Lines 20–21 state that “reduction stores energy, while oxidation releases it,” and line 17 states that “photosynthesis is a reduction reaction.” So, (III) cannot be correct. Since (I) and (II) are correct, the answer is (J).
35. (C) (p. 509) *Reading/Natural Science/Main Idea*. The paragraph gives a systematic analysis of the process defined in preceding paragraphs.
36. (F) (p. 509) *Reading/Natural Science/Explicit Detail*. (G) is supported by lines 51–52, (H) is supported by lines 64–67, (J) is stated in lines 50–51. (F) states the reverse of the truth; it is ADP that is mixed with phosphate to form ATP (see lines 51–52).
37. (A) (p. 509) *Reading/Natural Science/Implied Idea*. A careful reading of lines 64–71 can lead to no other conclusion. A five-carbon sugar (RuDP) is combined with carbon dioxide (CO_2), ultimately resulting in the formation of a three-carbon sugar (PGAL).
38. (G) (p. 510) *Reading/Natural Science/Implied Idea*. Growing periods, (J), are never discussed. Higher temperatures, (H), as indicated in the final paragraph, can lead to disagreeable conditions. Lines 72–78 state that the photorespiration, with its seemingly wasteful result, occurs when CO_2 levels are low, suggesting that a higher level of CO_2 would be a more agreeable condition. Also, more agreeable conditions facilitate carboxylation. This process involves combining CO_2 . Therefore, more CO_2 means an increase in carboxylation.
39. (B) (p. 510) *Reading/Natural Science/Explicit Detail*. As stated in line 17, photosynthesis is a reduction reaction, which makes (III) an incorrect choice. Lines 67–69 and lines 72–75 indicate that RuDP is used in carboxylation and photorespiration, making (I) correct. Another difference, as stated in lines 75–76, is that no ATP is created via photorespiration, (II).
40. (H) (p. 510) *Reading/Natural Science/Main Idea*. The angiosperm plants discussed in the final paragraph *do* photosynthesize—(J)—but they do it in an unusual way, using their specialized leaf structure.