

Conversion Table for Translating Raw Scores to Scaled Scores

Scale Score	English	Mathematics	Reading	Science Reasoning
36	75	60	40	40
35	74	—	39	—
34	73	—	38	39
33	72	59	37	—
32	—	57-58	—	—
31	71	55-56	36	38
30	69-70	53-54	36	37
29	67-68	51-52	—	36
28	66	49-50	33-34	35
27	63-65	46-48	32	34
26	61-62	44-45	31	33
25	59-60	41-43	30	31-32
24	56-58	39-40	28-29	29-30
23	54-55	37-38	27	27-28
22	51-53	35-36	25-26	26-26
21	49-50	33-34	24	23-24
20	46-48	31-32	22-23	21-22
19	43-45	28-30	21	19-20
18	40-42	25-27	20	17-18
17	38-39	22-24	19	15-16
16	35-37	18-21	17-18	13-14
15	32-34	15-17	16	12
14	29-31	12-14	15	10-11
13	26-28	10-11	13-14	09
12	23-25	08-09	12	08
11	20-22	06-07	10-11	07
10	17-19	05	08-09	06
9	15-16	04	07	05
8	12-14	—	06	04
7	10-11	03	05	03
6	08-09	—	—	02
5	06-07	02	04	—
4	05	—	03	—
3	03-04	01	02	01
2	02	—	01	—
1	00-01	00	00	00

This table is an example of an ACT conversion table. Actual conversions may vary from test to test. The ACT Composite score is calculated by averaging scores on the four subtests.

ANSWER EXPLANATIONS FOR ACT PRACTICE TEST

ENGLISH TEST

Passage 1: Running a Marathon

1. The underlined portion is part of a run-on sentence. There are two complete sentences here which need to be separated by correct punctuation, such as a semi-colon or a period. Therefore, answer B is the best option.
2. This item tests knowledge of subject-verb agreement. The subject of the sentence “challenges” is plural and requires a plural verb. Answer J is the only option with a plural verb—“are”—which makes it the best answer.
3. This item tests knowledge of proper use of the colon. The underlined portion of the text contains an introductory phrase followed by a list, a situation requiring a colon. Because a colon is used to indicate that some sort of list will follow, answer A, “No Change,” is the best option.
4. The underlined portion, as written, creates a run-on sentence. A period is needed to separate the two parts. This narrows the possible answers to H and J. Because a comma is needed to set off the introductory phrase “Prior to training,” answer H is the correct answer.
5. This item tests knowledge of the use of transitional words or phrases. Because the writer refers to adding to the 20 mile base, the phrase in answer C, “In addition to,” is the most logical choice.
6. The best way to strengthen the ideas in the paragraph would be to add the suggestion in answer F because it would require the writer to expand on an aspect of the training schedule. The other possible answers contain suggestions that really do not have anything to do with the paragraph.
7. This sentence contains a list of words that need to be separated by commas. Answer B contains the appropriately placed commas, and is the best answer. The other options contain inappropriate punctuation or are missing punctuation.
8. The underlined portion of the text contains information that is not relevant to the context of the rest of the paragraph. Therefore, the best option would be to omit the underlined portion, or answer J.
9. This question tests knowledge of proper use of adjectives. The noun, “sleep,” needs to be modified by an adjective or adjectives that specify “how much” sleep. Options A and B are redundant. The correct comparative form of the adjective is “more than,” answer C. Answer D is incorrect because it contains the superlative form of the adjective.
10. This item tests knowledge of noun-pronoun agreement. The pronoun in the underlined portion refers to the nouns “alcohol and caffeine” in the preceding sentence. Because two singular nouns grouped together form a plural, the plural form of the pronoun referring to them is needed. Answer G contains a plural pronoun and is the correct choice.
11. This item tests knowledge of appropriate use of adverb forms. The underlined portion is an adverb which modifies the adjective “satisfying.” The proper adverb form is “emotionally,” answer D.
12. The part of the underlined portion that begins with “When” is part of a sentence fragment. It is a dependent clause and needs to be joined to the preceding main clause. Answer G accomplishes this objective.
13. The underlined portion needs to be an adverb modifying the verb “perform.” Because “good” is an adjective, not an adverb, options B and D are incorrect. Option C contains redundant adverbs. Therefore, answer A, which contains the adverb “well,” is the best choice.
14. Paragraph 2 is the one that refers to training schedules and would be the best paragraph within which to place the new material. Answer G.
15. The question asks if this essay fulfills the assignment of writing about one’s personal experience in running a first marathon. Because the entire essay is about training for a marathon, answer D would be the best choice.

Passage 2: Talented Individuals

16. This item contains the beginning of a list—“Olympic”—that needs to be set off from the preceding part of the sentence. Because the dash is one form of punctuation that may be used to set off information, answer H is the best option.
17. The underlined portion, if left as written, creates a sentence fragment. The first part of this paragraph is a dependent clause which needs to be joined to the main clause which follows it. Answer B accomplishes this objective by linking the dependent clause and the main clause with a comma.
18. This item tests proper use of the conjunction “and.” In the underlined portion, the “and” preceding “education” is not necessary. Answer J is the only option that does not contain this “and,” which makes it the best option.
19. The issue here is how best to transition from the second to the third paragraph. Answers A, B, and C contain transitional words or phrases that suggest that the third paragraph will contain ideas which contrast with the ideas presented in the second paragraph. The third paragraph, however, contains ideas that build upon those presented in the second paragraph. Therefore, answer D is the best choice.
20. The answer for this item needs to be an adverb modifying the adjective “educated.” Answer G is wrong because “good” is an adjective. Answer H is wrong because “too” does not fit with the context. Answer F works because “well” is an adverb that modifies the adjective “educated” in a way that makes sense given the context.
21. The underlined portion, if left as written, creates a run-on sentence. The two complete sentences need to be separated by proper punctuation, such as a period. Answer B accomplishes this objective.

22. “Although,” a conjunction meaning “regardless of the fact that,” is often placed at the beginning of its clause. In this item, “Although,” is placed at the beginning of an introductory dependent clause and fits the context of the sentence. Answer F.
23. In this item, an appropriate pronoun is needed. The underlined portion refers to the noun “parents” in the clause which precedes it. Answer D is the choice which contains the proper form of the pronoun—“they.”
24. In this item, an appropriate adjective is needed. The comparative form of adjective is required because “talented individuals” are being compared with “their less talented peers.” Answer J is the option which contains the comparative form—“more curious.”
25. In this item, an appropriate adjective is needed. The comparative form of adjective is required because “talented individuals” are being compared with “their less talented peers.” Answer A is the option that contains the comparative form—“more adventuresome.”
26. This item tests knowledge of pronouns and possessive forms of nouns. The pronoun in the underlined portion needs to refer to “parents.” Because “parents” is plural, the plural pronoun “their” is needed, which eliminates options F and J. Answer G is correct.
27. This item tests noun-pronoun agreement. The underlined word needs to be a pronoun which refers to the noun “woman.” Because woman is singular and feminine, a singular, feminine pronoun is needed. Answer A—“her”—meets this objective.
28. What does the adverb “actively” modify? If it modifies the verb “encourage,” it should be placed after the verb. This is not an option. Given the choices, the most appropriate use of this adverb would be to modify “playing games.” Thus, parents are playing games “actively” with their children. Answer H.
29. This question asks the reader to decide which of the possible options would most logically continue the discussion. Because the passage ends with a discussion of ways in which parents and teachers encouraged talented individuals, providing specific examples of how teachers encouraged children would logically continue the discussion, making answer A the best option. Answers B, C, and D are either irrelevant to the discussion or are only weakly linked to the discussion.
30. This item asks about the tone the writer used in this passage. This item is challenging, because it also tests vocabulary. “Impartial,” which means “unbiased,” is the option which best reflects the tone of the passage. Answer H.

Passage 3: Teaching Psychology

31. For this question, answers A and B are incorrect because they imply an unnecessary comparison with the use of “more than” or “more.” Answer C is incorrect because it contains redundant words. Answer D is the correct choice because it clearly and succinctly describes the students as “uninterested.”
32. In this item, the adjectives “bright” and “attentive” need to be separated by proper punctuation, such as a comma. Answer G.
33. For this question, there is a need for the verb in the underlined portion of the text to be parallel in form with the other verbs in the sentence. Because the other verbs in the sentence are in the present tense, the underlined portion of the text also needs a verb in the present tense. Answer D.
34. In this item, verbs in the past tense are required because the writer is describing something that he experienced in the past. Thus, options G and J may be ruled out because they contain verbs that are in the present tense. Of the two remaining options, F and H, option F is the best choice because it contains the most appropriate preposition, “on.”
35. This item, as written, creates a run-on sentence. The two complete sentences of which the underlined portion is a part need to be separated by appropriate punctuation. Answer B will not work because the first of the two sentences is not a question. Answer D is not appropriate because a word following a semicolon should not be capitalized. The best choice would be to separate the two sentences with a period, or answer C.
36. This item, if left as written, creates a dangling modifier. In the underlined portion, the correct subject is needed to modify the introductory clause “Seeking help...” The subject is “I,” and the action occurred in the past. Answer H.
37. In this item, the singular pronoun “its” is inappropriate because the pronoun referent “textbooks” is plural. The best answer is D.
38. The underlined portion of the text along with options G and H contain information that is not relevant to the remainder of the passage. Therefore, the underlined portion of the text should be omitted. Answer J.
39. In this item, the goal is to find the best transitional word to link the third paragraph to the fourth. Because the fourth paragraph builds upon the ideas presented in the third paragraph, “In contrast” and “However” will not work because these terms are used to introduce ideas that are in opposition to the preceding ideas. Answer A (“For instance”) works better than answer C (“In addition”) because in the fourth paragraph, the author provides examples of the things discussed in the third paragraph.
40. This item tests knowledge of punctuation. The structure of this item is that of a sentence followed by a list. The proper punctuation to precede a list is the colon; answer G, therefore, is the best choice.
41. The underlined portion for this item, if left as written, creates a sentence fragment. Answer D also creates a sentence fragment. The word “though” in answer B is redundant with the word “however” which precedes it. Answer C is the best option.
42. This question asks how the ideas presented in paragraph 4 could be strengthened. The only option that contains a topic that is directly related to the main ideas in paragraph 4 is option F. All of the other options contain topics that are unrelated or only slightly related to paragraph 4.

43. In this item, because the author asks a question, a question mark is needed following “to be.” Thus, options C and D are clearly wrong. Option A is also incorrect because it is generally not appropriate to begin a sentence with “and.” Therefore, answer B is the best choice.
44. This item, as written, is an example of awkward or unidiomatic expression. That is, the expression is unnatural sounding and would not be used in either written or spoken English. Item G is incorrect because it is an example of unnatural expression too. Item J omits a necessary word—“that” – before “relate.” Item H is the correct answer because it is idiomatic and complete and fulfills the requirements for making a meaningful sentence.
45. In this item, a new sentence is presented and a decision needs to be made about the best paragraph into which to insert the sentence. Because the sentence relates to the author’s skill as a teacher, paragraph one—in which the author talks about his teaching experience—would be the most relevant paragraph for the sentence. Answer A.

Passage 4: Searching for Bill Gates

46. This item, if left as written, creates a dangling modifier. In the underlined portion, the correct subject is needed to modify the introductory clause “On a recent trip.” The subject is “I,” which means that options F and G are incorrect. Also, the comma at the end of the underlined portion is needed in order to set off the underlined clause from that which follows it. Answer J.
47. For this question, options A and D are incorrect because they contain redundant expressions—“talk” and “conversation.” Of the remaining options, B and C, C is the best choice because it contains the infinitive “to talk.”
48. In this item, the underlined portion, if left as written, creates a sentence fragment. The dependent clause that ends with “nickname” needs to be linked with appropriate punctuation to the main clause which follows it. Options G and H both link the two clauses with a comma. However, because the “t” in “the” does not need to be capitalized, answer H is the best choice.
49. In this item, the goal is to find the best transitional word or phrase to link the ideas in the paragraph. Because the sentence which precedes the transitional word/phrase is connected to the ideas in the sentence which follows, “However” and “In contrast” will not work because these transitional expressions are used to introduce ideas that are in opposition to those preceding ideas. Of the remaining options, answer A is the best because it includes a comma to set off the transitional phrase “At least” from the rest of the sentence of which it is a part.
50. In this item, “Microsoft” is an appositive and needs to be set apart with punctuation from the noun to which it relates—in this case, “company”—and from the rest of the sentence. Answer J is the only option which meets these criteria. Note: an appositive is a noun or noun phrase that is placed with another noun or noun phrase as an explanatory equivalent. Another example would be “My father, John, is a generous man” in which case “John” is an appositive in relation to “father.”
51. One of the answer options for this question—answer B—can be ruled out because it is irrelevant to the ideas presented thus far in the paragraph. Answers C and D are only slightly related to the ideas in the paragraph so that to expand upon them would be to stray from the ideas rather than to strengthen them. Answer A would strengthen the ideas in the paragraph because the author would provide a rationale for the change from Mr. Gates to “Bill,” thereby making the ideas in the paragraph clearer to the reader.
52. No change is required for this item (answer F) because the semi-colon is an appropriate form of punctuation for separating two phrases which are linked in meaning but can stand on their own grammatically. Answer G is wrong because it is not necessary to capitalize a word following a semi-colon. Answer H is wrong because the portion of the text following the punctuation is a complete sentence, not a list of some sort. Answer J is wrong because without any punctuation, a run-on sentence is created.
53. In this item, the wrong answers all contain redundant information. Answers A, C, and D are incorrect because “smart” and “intelligent” are redundant words. Answer B, on the other hand, simply specifies that the people are “smart,” so it does not contain any redundancies.
54. Answers F and G may be eliminated because both of these options create a run-on sentence. Answer H is the best because it contains the gerund “implying” which modifies “product” but also includes “buyer” which is the object of the gerund.
55. In the underlined portion of the text, a transitional word is needed that will set up a contrast between the ideas in the sentence preceding the semi-colon and the ideas in the sentence following the semi-colon. Because “however” is the only word which implies a contrast of ideas, answers A and C may be eliminated. Of the two remaining options—B and D—answer B is the correct choice because it provides the necessary subject of the clause, “I.”
56. In this item, no change is required because the best choice is to separate the two complete ideas contained in the underlined portion of the text with a period. A semi-colon would have been appropriate, but this form of punctuation is not provided as an option. Answer F.
57. The present verb tense is needed in this item (answer D—“resides”) because the author is talking about a characteristic of himself that is ongoing in the present rather than residing in the past or future.
58. The only option that is relevant to the paragraph in question is answer H. All of the other options have little or nothing to do with the ideas in the paragraph.
59. The sentence in question would be most logically inserted in paragraph 2 because this is the one paragraph in the passage that explicitly describes “the Web” and the way in which it is being promoted and used. Answer B.

60. The use of the first person pronoun is appropriate in this type of essay, so answers H and J may be ruled out. Because it is not necessarily true that travel narratives be offered in the first person, answer G may be eliminated. Given the appropriateness of writing about personal experiences in the first person, answer F is the best choice.

Passage 5: Sport Headlines

61. The underlined portion of the text contains a verb phrase which needs to match up with the noun preceding it. Because the noun “list” is singular, the verb form also must be singular. Thus, options A and D, which contain plural verbs, may be ruled out. Of the two remaining options, answer B is the best choice because the other option, answer C, contains an unnecessary comma.
62. In the underlined portion of the text, a present tense verb form is needed because the author is referring to a situation that is ongoing in the present rather than residing in the past or future. Answer J is the only option containing a verb form in the present tense.
63. As written, the sentence beginning with “Usually” is a fragment. This dependent needs to be joined to the end of the previous sentence. A comma can be used to join a dependent clause to the end of an independent clause. Answer C.
64. The underlined portion, as written, creates a run-on sentence. Option J is the only choice that eliminates the run-on sentence.
65. In this item, a transitional word is needed that will set up a contrast between the ideas preceding the underlined portion of the text and the ideas following it. Answer B is the correct choice because it is the only option containing a transitional word which implies a contrast between ideas. The other options either contain transitional words which imply the continuation of an idea (answers A and C), or contain no transitional words at all (answer D).
66. Because the underlined portion of the text is part of a grammatical structure consisting of an independent clause followed by a list, a colon is the correct form of punctuation for separating the clause from the list. Answer F (No Change).
67. The underlined portion, as is, creates a sentence fragment (the portion beginning with “With”). Option C is the best because it provides a way to end one sentence and effectively begin a new sentence without creating a sentence fragment.
68. In this item, the goal is to find the best transitional phrase for building upon ideas presented in the paragraph. Option J may be eliminated because “Instead of” is typically used to establish a contrast of some sort. Of the remaining options, answer F is the best choice because it includes a comma to set off the transitional phrase from the rest of the sentence.
69. The goal in this item is to find the choice that makes the underlined portion of the text parallel with the rest of the sentence of which it is a part. Option B fits best. Option A is incorrect because it is missing a comma after “animals.” Options C and D are incorrect because the punctuation forms used (colon and semi-colon) are not appropriate for the context.
70. The sentence in question is not relevant to the ideas presented in the paragraph and, therefore, it should be omitted. Answer J.
71. The underlined portion of the text contains a pronoun that needs to correspond in case and number to the noun to which it refers. In this case, the noun “writers” is in the third person plural; thus, the pronoun must also be in the third person pronoun. Answer A contains the appropriate pronoun, “they.”
72. The option that would most clearly strengthen the ideas contained in paragraph number five would be option H. Option H would require the writer to expand upon ideas presented in the paragraph whereas all the other options are either only indirectly related or not at all related to the paragraph in question.
73. The article does not fulfill the assignment because the article has nothing to do with the public’s perceptions of athletes; rather, the article is about headlines. Answer D.
74. The sentence in question would be placed most appropriately in paragraph 5 because paragraph 5 explicitly addresses temporary changes in the meanings of verbs. Answer J.
75. The main idea of the passage is that “Many verbs can be used to describe winning and losing.” The author sets up the main idea in the first two paragraphs, provides examples of the different kinds of verbs used to describe winning and losing in the third and fourth paragraphs, and then describes the influence of the use of such verbs on language in the final paragraph. Answer A.

MATHEMATICS TEST

- To add or subtract fractions, find a common denominator. The lowest common denominator for 3, 4, and 9 is 36. Thus, $\frac{14}{3} = \frac{168}{36}$; $\frac{9}{4} = \frac{81}{36}$; and $\frac{11}{9} = \frac{44}{36}$. Then, do the calculations on the numerator: $168 + 81 - 44 = 205$. Reduce: $\frac{205}{36} = 5 \frac{25}{36}$. Answer B.
- First, use a common denominator of 12 for the numerator: $2 = \frac{24}{12}$ and thus $\frac{24}{12} - \frac{5}{12} = \frac{19}{12}$. Then, find a common denominator for the denominator: $1 = \frac{6}{6}$ and thus $\frac{6}{6} + \frac{5}{6} = \frac{11}{6}$. To divide fractions invert the denominator and multiply: $\frac{19}{12} \times \frac{6}{11} = \frac{19}{22}$. Answer F.
- Calculate 15 % of 160: $.15 \text{ times } 160 = 24$. She would like to raise her average so add: $160 + 24 = 184$. Answer D.
- First, calculate a 20% discount on \$25.50: multiply $.20$ by $25.50 = 5.10$. Then subtract: $25.50 - 5.10 = 20.40$. Finally, calculate the 7% sales tax: $.07 \text{ times } 20.40 = 1.428$. Add this to the discounted price: $20.40 + 1.428 = 21.828$. Round off to get answer H.

5. An average is calculated by adding individual scores and then dividing this sum by the number of scores. If the average for four weeks is 35 hours, then the sum of all the hours for the month is 140 (4×35). The first three weeks add up to 112 hours ($32 + 43 + 37$). This means the hours for the fourth week have to be 28 ($140 - 112$). Answer B.
6. An average (arithmetic mean) is calculated by summing scores and dividing by n , the number of scores. To find the average of two averages, you must first find the separate sums. In this case, for the first church, 150 members \times \$100 = 15,000, the sum of the donations; for the second church, 100 members \times \$150 = 15,000. Add the two sums: $15,000 + 15,000 = 30,000$. Then divide by the total n : $150 + 100 = 250$. The combined average is $30,000/250 = \$120$. Answer H.
7. First divide Mental Age by Chronological Age. This is represented symbolically by MA/CA. Only options A and E do this division correctly. Then multiply by 100. Answer A presents this correct multiplication.
8. The answer has to be expressed in cents, c . Every quantity must be changed to cents, in order to calculate the correct change. In this problem, d dollars would be $100d$ as cents and q quarters would be $25q$ as cents. Thus, the correct change is represented in Answer G.
9. Collect like quantities. In this problem, $2x^2 - x^2 = x^2$. Also, $10 - 5 = 5$ (remember to clear parentheses correctly). The $-Px$ term is unchanged. Answer C.
10. First, expand $(x - 5)^2$: $x^2 - 10x + 25$. Then expand $(x - 3)^2$: $x^2 - 6x + 9$. Then subtract the two quantities: $x^2 - x^2 = 0$; $-10x - (-6x) = -4x$; and $25 - 9 = 16$. Answer G.
11. To factor, isolate the largest number and variables that can be divided into each term. The number 10 is the largest factor of 10, 20, and 30; c is the largest factor for the variable that contains c ; and d is also the largest factor for the variables that contain d . Factoring out $10cd$ leaves $(c^2 - 2cd - 3d^2)$. Factoring this term gives Answer E.
12. An equation is undefined when division by zero is attempted. In this problem, the denominator would be zero when x is either 0, 2, or -5. Answer K.
13. Use a common denominator of 20 for all the fractions: $1/4 = 5/20$; $2 \frac{2}{5} = 12/5 = 48/20$. Subtract fractions on the left side: $17/20 - 5/20 = 12/20$. Add $48/20$ to both sides. Thus, the solution is $x = 60/20$ or $x = 3$. Answer D.
14. Multiply both sides of the equation by the common denominator of 12. The equation now becomes the following: $4x + 3x = 24x - 36$. Collecting terms produces the following equation: $17x = 36$, or $x = 36/17$. Answer K.
15. To add or subtract radicals, you must have a common term under the radical sign. The square root of 80 factors into 16 times 5 or $4\sqrt{5}$. The square of 125 factors into 25 times 5 or $5\sqrt{5}$. The addition then becomes $3(4\sqrt{5}) + 5(5\sqrt{5})$ or $37\sqrt{5}$. Answer C.
16. Expand these quantities just like you'd expand $(a - b)(a - b)$. $\sqrt{5} \sqrt{3} = \sqrt{15}$; $-\sqrt{3}(\sqrt{3}) = -3$; $-\sqrt{5}(\sqrt{5}) = -5$; and $-\sqrt{3}(-\sqrt{5}) = \sqrt{15}$. Collecting terms gives you answer J.
17. When multiplying numbers with a common base, you can add the exponents. Thus, $2^3 \times 2^5 = 2^8$ and $3^4 \times 3^2 = 3^6$. When raising an exponent to an exponent, multiply the exponents. $(2^8)^2 = 2^{16}$ and $(3^6)^3 = 3^{18}$. Answer B.
18. First, multiply and divide the specific numbers: $(2.5)(1.2)/.3 = 10$. Then multiply the powers of ten in the numerator: $10 \times 10^3 \times 10^3 = 10^9$. Then divide $10^9/10^{11} = 10^{-2}$ or .01. (Remember to subtract exponents when dividing with a common base.) Answer H.
19. Substitute values into the formula: $d = (32 \text{ ft/sec}^2)(60 \text{ sec})^2$. This calculation produces answer D.
20. Substitute values into the equation: $(-2)^3(3)^2 - (-2)(3)/[3^2 - (-2)]$. The numerator becomes $(-8)(9) + 6$ or -66. The denominator becomes $9 + 2$ or 11. The final division produces answer J.
21. First, do the calculations in parentheses: $10 - 3 - 2 = 5$. Then $2 - 5 = -3$. The absolute value of -3 is 3. Answer C.
22. There are usually two solutions to absolute value equations. In this problem, the absolute value of $10 = 10$ and the absolute value of $-10 = 10$. So solve the two equations: $y - 3 = 10$ or $y = 13$ and $y - 3 = -10$ or $y = -7$. Answer K.
23. Divide both sides of the equation by -2 and remember to reverse the sign of the inequality. This produces the following inequality: $(x + 2) \leq -2$. Add -2 to both sides to produce $x \leq -4$ or answer A.
24. Expanding and rearranging this inequality produces the following result: $x^2 + 2x + 4 > 0$. Trying a few numbers reveals that all real x will hold in this inequality. Answer F.
25. $(-5)^2 = 25$; $5^{-2} = 1/25$; and $5^0 = 1$. Then add: $25 + 1/25 + 1 = 26 \frac{1}{25}$ or answer C.
26. $27^{-2/3} = 1/27^{2/3}$. This becomes $1/\sqrt[3]{27^2}$. This reduces to $1/9$ or answer G.
27. First, use a common denominator, $\sqrt{5}$. 1 becomes $\sqrt{5}/\sqrt{5}$. This produces the following: $(1 - \sqrt{5})/\sqrt{5}$. Multiply both numerator and denominator by the following: $\sqrt{5}/\sqrt{5}$. This produces answers A.
28. Multiply both numerator and denominator by the $(\sqrt{x} + \sqrt{y})/(\sqrt{x} + \sqrt{y})$. Expanding both numerator and denominator produces answer H.
29. The slope formula is as follows: $(y_2 - y_1)/(x_2 - x_1)$. Substituting the appropriate values produces the following: $(8 - 4)/(15 - 3)$ or $4/12$ or $1/3$. The slope is thus $1/3$. The correct equation is either answer D or E. Substitute the coordinates, (3,4), to see which equation holds. Answer E.
30. Rearrange this equation into the slope-intercept form, which is $y = mx + b$. This equation becomes $-4y = -7x - 16$. Multiply through by -1 to produce $4y = 7x + 16$. Divide both sides by 4: $y = 7/4x + 4$. The slope is $7/4$ and the y -intercept is 4. Answer F.
31. The midpoints are calculated by averaging the (x, y) coordinates. For the x value, average $(4 + -3)/2 = 1/2$; for the y value, average $(1 + -1)/2 = 0$. Answer A.

32. To calculate the distance between two points use the following formula: $\sqrt{(x_2 - x_1)^2 + (y_2 - y_1)^2}$. Substituting the coordinates produces $[-1 - (-1)]^2 + [-3 - 7]^2$ or $0 + 100$. The square root of 100 is 10 or answer K.
33. The length of the major axis, a , is 4 and the length of the minor axis, b , is 3 of this ellipse centered at the origin. The standard equation of an ellipse centered at the origin is $x^2/a^2 + y^2/b^2 = 1$. Since the major axis is vertical, the equation changes to $x^2/b^2 + y^2/a^2 = 1$. The correct answer is B.
34. For the circle to intersect the y -axis, the x coordinate needs to be zero. Substituting answers F, G, and H into the equation reveals that only the coordinates $(0, -3)$ will produce the value of 17. Answer G.
35. Expanding the left side produces $x^2 - 2x + kx - 2k$. Collecting terms and factoring an x in the middle term gives us $x^2 + x(k - 2) - 2k$. Comparing to the right side of the equation indicates that $n = k - 2$. Answer E.
36. Find a common denominator for the numerator (x^2) : $(x^2 - 4)/x^2$. Find a common denominator for the denominator (x) : $(x - 2)/x$. In the numerator the expression, $(x^2 - 4)$, factors into $(x - 2)(x + 2)$. Invert the denominator and multiply. The $(x - 2)$ term cancels, as does an x . This leaves answer J.
37. From the graph, the number of automobiles sold in 1991 was 2000. The amount sold in 1992 was 3000. The percent increase is calculated as follows: $(3000 - 2000)/2000$. This calculation equals .50 or, as a percent, 50%, Answer B.
38. Rearranging the equation into slope-intercept form gives us $y = -2x + 4$. Thus, the slope is -2 and the y -intercept is 4. Only lines F, J, and H have a y -intercept of 4 and only line F has a negative slope. Answer F.
39. Add the total parts of the ratio $(2 + 3 + 4)$ to get 9 total parts. Dividing \$45,000 by 9 gives the value of one part: \$5,000. The oldest receives 4 parts, or \$20,000. Answer C.
40. Set up the following equation: $(x + 2) + (x + 4) + (x + 6) = 24$. Collect terms to get: $3x + 12 = 24$. This gives $3x = 12$ or $x = 4$. The value of the shortest segment is $x + 2$ or 6. Answer G.
41. The sum of the angles along a straight line totals 180 degrees. In this problem, $x + y = 130$, since we already have one angle equal to 50 degrees $(180 - 50) = 130$. Answer C.
42. First, solve for y : $4y = 180$, or $y = 45$ using the same fact as in problem 41. Thus, $x = 90$. Answer J.
43. The angle supplementary to the indicated angle is equal to 52 degrees, since alternate interior angles in parallel lines are equal. This makes the indicated angle equal to $180 - 52$ or 128. Answer B.
44. Angle x also measures 120 degrees due to the same relationships between angles as expressed in problem 43. Answer K.
45. Use the formula for the area of a triangle: $A = 1/2 (bh)$. This problem gives us the area and the base: $24 = 1/2 (4) (h)$. Solve the equation: $24 = 2h$ or $h = 12$. Answer D.
46. The side of triangles are proportional to one another in similar triangles. Set up the ratio: $a/b = d/e$. Substitute values: $15/20 = 30/e$. Solve: $15e = 600$ or $e = 40$. Answer G.
47. Use the Pythagorean theorem: $a^2 + b^2 = c^2$. In this problem, $5^2 + b^2 = 13^2$. This gives $b^2 = 169 - 25$ or $b^2 = 144$ and $b = 12$. Answer D.
48. In a 30-60-90 right triangle, the sides are in the ratio, $1:\sqrt{3}:2$. In this triangle, side DF is opposite the 60 degree angle. It measures $5\sqrt{3}$. Side FE is also opposite the 60 degree angle in the smaller right triangle. It measures $3\sqrt{3}$. The difference in these two measures gives us the length of line segment DE. Answer G.
49. Let $w =$ width. Then length $= 2w$. The perimeter of a rectangle is $2l + 2w$. In this problem, $2(2w) + 2w = 60$. This gives $6w = 60$, or $w = 10$. The length is therefore $2w$ or 20. Answer D.
50. The formula for the area of a rectangle is $A = lw$. In this problem, the expressions for length and width must be multiplied and the terms expanded as follows: $(3\sqrt{2})(3\sqrt{2}) = 9$ times 2, or 18. The middle terms cancel. And 2 times -2 equals -4 . Add for the final answer: $18 + (-4) = 14$. Answer G.
51. The formula for the area of a circle is πr^2 . The diameter is 10, so the radius is 5. Substituting into the formula gives 25π , or answer D.
52. The formula for the circumference of a circle is $C = \pi d$. The circumference of this circle is 500 feet. Given that a mile equals 5280 feet, divide this amount by 500 feet to produce the number of times the track must be circled. Using $\pi = 3.14$ gives answer F, rounded off.
53. If the perimeter of the rectangle is 46, then the length is 15 (The width is 8; substituting into $2l + 2w = 46$ gives $l = 15$). The area of the rectangle is 15 times 8, or 120. The area of the triangle is given by $A = 1/2 bh$ or $A = 1/2 (6)(8)$, or 24. The combined area is 144, or answer D.
54. If the area of the square is 144, then a side is 12. This means that the base of the indicated triangle is 12 and its height is also 12. Using the area formula, $A = 1/2 bh$, gives us $1/2 (12)(12)$ or 72. Answer G.
55. The triangle is isosceles. The length of OA and OB are both 6. OA and OB are also the radii of the circle. Using the formula for the area of a circle, $A = \pi r^2$, gives us 36π , or answer E.
56. The radius of the circle is 4. The area of the circle is 16π . To find the shaded area, subtract the area of the circle from the area of the triangle. Answer G.
57. If the area of the square is 36, then a side is 6. Set up the isosceles right triangle OBC. Use the Pythagorean theorem to solve for a leg of this triangle, which is also the radius of the circle. Solve the following equation: $r^2 + r^2 = 6^2$. Thus, $2r^2 = 36$, or $r^2 = 18$. The area of the circle is 18π . Answer C.
58. The area of the rectangle is 10 times 3, or 30. The radius of the circle is 1.5. The area of the circle is $\pi (1.5)^2$ or 2.25π . To find the shaded area, subtract the area of a circle from the area of the rectangle to give answer G.

59. A tangent of an angle is defined as opposite side/ adjacent side. In this problem, the side opposite angle Q is a and the side adjacent to it is b. The correct answer is A.
60. The sine of an angle is defined as the opposite side/ hypotenuse. In this problem, the side opposite to angle BAO has a length of 4. This is a 3-4-5 right triangle. The hypotenuse has a length of 5. The sine is 4/5 or answer H.

READING TEST

Passage 1: Prose Fiction

1. The correct answer, green, is found in line 38 of the passage. Answer B.
2. The answer is implied in lines 8 through 11—"I received my first impressions of the city in walking down to the Customhouse on the morning after our arrival, which was Sunday." If the morning after the arrival is Sunday, then Saturday must have been the day that Dickens's ship landed at Boston. Answer H.
3. The answer is found in lines 41 and 42: "every thoroughfare in the city looked exactly like a scene in a pantomime." Answer C.
4. The answer is found in lines 21 and 22: "Not being able, in the absence of any change of clothes, to go to church that day." Answer F.
5. The answer is contained within lines 68 through 73. Beginning in line 68, the author is clearly describing the city rather than the suburbs, and then in lines 72 and 73, he specifies that "The State House is built upon the summit of a hill." Answer B.
6. The answer is found in lines 18 through 20: "The number of creeds and forms of religion to which the pleasure of our company was requested was in very fair proportion." In this statement, it is implied that the offers Dickens received were fairly evenly distributed among various different creeds and forms of religion. Answer F.
7. The answer is implied in lines 59 and 60: "The suburbs are, if possible, even more insubstantial looking than the city." Here, insubstantial means "lacking reality; imaginary." Answer A.
8. The suggested strategy here would be to find the one statement among the four answer options that contradicts what is stated in the passage. The answer is found in lines 100 and 101: "the amount of vanity and prejudice it has dispelled." Answer J clearly contradicts this statement which makes it the correct answer.
9. The answer is implied in lines 45 and 46: "many occupations are often carried out in one house." From this statement, it can be inferred that the space above the street-level store is used for tradesmen of other occupations. Answer C.
10. The answer can be found in lines 59 through 67. In line 59, we learn that Dickens is describing the suburbs which he then refers to as being "like a child's toy" in lines 66 and 67. Answer G.

Passage II: Social Sciences

11. The correct answer may be inferred from the information in lines 5 through 8: "these are the conditions under which most witnesses testify: they are asked to describe an event that may have frightened them or an event that was of only marginal interest to them." Answer B.
12. The information needed to answer this question is contained in lines 40-42. Answer H correctly lists the sequence of speeds from slowest to greatest speed: contacted (32 mph), hit (34 mph), bumped (38 mph), and smashed (41 mph).
13. The answer to this question can be inferred from paragraphs four and five (lines 50-69). Within these paragraphs, remembering is described as being like all of the following: recalling events when asked probing questions (lines 56-59); attempting to speak with the past (lines 67-69); and being influenced by intervening events (lines 62-65). Answer A—"videotaping an event"—is the only option that is not mentioned anywhere in the passage as being like remembering. Thus, it can be said that remembering is LEAST like answer A.
14. The correct answer to this question is found in lines 32 through 34: "The frequency of 'I don't know' answers was 38% for 'a questions' and only 13% for 'the questions.'" Answer G.
15. The answer to this question can be inferred from the information in lines 45 through 48: "53% of people asked the question 'How fast was Car A going when it ran the stop sign?' reported that they saw a stop sign." If 53% of the people reported seeing a stop sign, then it may be inferred that 47% of the people did NOT report seeing a stop sign. Answer B.
16. The answer to this question can be found in lines 31 through 33: "only 7% of 'a question' witnesses said yes. The frequency of 'I don't know' answers was 38% for 'a questions.'" Thus, if 7% said "Yes" and 38% said "I don't know," for a subtotal of 45%, then 55% must have said "No." Answer J.
17. This question asks about the main idea of the passage as a whole. To answer this question successfully, it helps to realize the following: answer A cannot be correct because the passage shows how inaccurate memory can be rather than how accurate it can be; answer B cannot be correct because the author never criticizes the experiments on eyewitness testimony; and answer D cannot be correct because, although Freud is mentioned in the final sentence of the passage, at no point does the author explain how recent memory research is derived from Freud. Therefore, answer C is the only option that accurately reflects the main idea of the passage.
18. The answer can be found in lines 72 through 75: "If I am unable to remember something I 'ought to be able to,' such a lapse must have some personal significance for me. Forgetting and remembering, like all the activities of a life, reveal us to ourselves and to others." Answer F.

19. The answer to this question is found in lines 20 and 21: “a group of students (usually 100 at a time).” Answer D.
20. The answer to this question must be inferred from the information provided in lines 53 through 56: “Even for the most scrupulously honest subject, information given (or, perhaps more important, asked for) after an event has been experienced will affect what is remembered about that event.” From this information, it may be inferred that any leading question has the potential to alter what is remembered about an event. Because answer G is the only option that does not contain a leading question, it is likely that the author would view this as a good first question to ask eyewitnesses of an accident.

Passage III: Humanities

21. Answer A is incorrect because the passage does not explain the changes to the revised SAT in detail. Answer C is incorrect because the passage does not contain a list of ways for students to prepare for the SAT. Answer D is too narrow in that the passage does more than just address the changes to the time limits on the revised SAT. The best choice is answer B.
22. The meaning of the word “understand” must be taken from the context in which it is presented: “It is very satisfying to see students come to ‘understand’ this exam well enough to achieve scores that help them gain admission to the colleges they choose.” In this context, answers G (“criticize”) and J (“explain”) do not make sense, so these answers may be eliminated. The careful reader will also rule out answer H (“pass”) because it does not make sense to talk about passing an exam “well enough.” The option that makes the most sense is answer F (“be prepared for”).
23. This question concerns the author’s tone which must be inferred from the passage as a whole. This question also taps vocabulary knowledge, which makes it potentially a more difficult item. Because the author expresses doubts about the changes to the new SAT (see lines 102-104), the best option is C, “skeptical.”
24. While this question is primarily a vocabulary question, the context is also helpful for getting the correct answer. “Reverie” is defined as “abstracted musing or daydreaming.” Answer J.
25. The answer to this question can be found in paragraph five (lines 68 through 83). The old SAT had 85 verbal questions and 60 math questions for a total of 145 questions. The revised SAT has 78 verbal questions and 60 math questions for a total of 138 questions. Subtract 138 from 145 to get the difference between the revised SAT and the old SAT. Answer A.
26. The correct answer may be found in lines 95 through 97: “educators have called for different types of assessments: performance assessments, authentic assessments, exhibitions, portfolios, and the like.” The only type of assessment not mentioned by the author was vocabulary tests. Answer J.
27. The answer to this question can be found in paragraph five (lines 68 through 83). The revised SAT allows students 75 minutes for the verbal sections and 75 minutes for the math sections for a total of 150 minutes. Answer C.
28. The answer to this question may be found in lines 47-52: “The revised SAT recognizes the increasing diversity of students in our educational system, as well as changes in how and what these students are being taught in secondary school. The new testing program will assess many of the skills important to students’ success in college.” The only answer option not mentioned was answer G—revisions in national mathematical standards—which makes it the correct answer.
29. The answer to this question is implied in the information found in lines 8 through 12: “As always, the Educational Testing Service (ETS) and the College Entrance Examination Board have helped me with my task by publishing collections of previously administered exams.” Answer D.
30. In the passage, the author criticizes the SAT for only allowing about one minute per problem. Thus, one can infer that the author would prefer an exam with more time per question. Answer D is the only option that allows more than a minute per question.

Passage IV: Natural Sciences

31. The answer is found in lines 25 through 28: “Prions are considered an entirely new type of disease-causing agent, distinct from bacteria, viruses, fungi, or parasites.” Answer D.
32. The answer to this question is in lines 13 through 16: “A new strain considered its human equivalent, Creutzfeldt-Jakob disease (CJD), is still rare, affecting just one in a million people annually in the United States.” Answer H.
33. This answer is found in lines 16 through 18: “This disease, however, is fatal, and kills its victim about seven months after symptoms appear.” Answer A.
34. The answer to this question may be inferred from information contained in lines 51 through 53: “at the present time the fact remains that there are no definitive data on the nature of prions.” Since “inconclusive” is the opposite of “definitive,” answer G seems to be the best choice.
35. The correct answer is found in lines 71 through 74: “The ‘slow’ mice developed the disease in 250 days, while those engineered to have the ‘fast’ version developed BSE in 133 days.” Answer A.
36. The answer can be determined from information in lines 4 through 11: “health officials report that about six percent of the mule deer in the area of northern Colorado and southern Wyoming suffer from chronic wasting disease, or CWD. The entire population of mule deer in Colorado, about 550,000 according to recent estimates, is at risk of developing certain forms of CWD.” Six percent of 550,000 is 33,000. Answer G.
37. From lines 15 and 16, we know that CJD occurs in the United States. From lines 75 through 78, we know that CJD occurs in Britain. Since Europe is not mentioned in the article, answer C is the best option.

38. The answer to this question is found in lines 79 through 83: “What is not clear, however, is whether the slow version means infected people will develop the new variant of CJD more slowly, or whether it makes the incubation period so long that they will never develop it at all.” Answer J.
39. The answer to this question is found in lines 37 through 40: “All the prion diseases are apparently associated with the accumulation in the brain of an abnormal protease-resistant isoform of the prion protein PrP.” Answer D.
40. The correct answer may be located in lines 67 through 69: “The difference between the two genes is subtle—only two amino acids are affected.” Answer G.

SCIENCE REASONING TEST

Passage I

1. Heat of combustion for alcohol is 6400 and for lean meat is 1200. The difference is 5200. Answer C.
2. Heat of combustion is as follows: ice cream, 2100; white sugar, 4000; and pine wood, 4500. Pine wood has a slightly higher heat of combustion than white sugar, and white sugar is twice ice cream. The correct graphic representation is presented in answer G.
3. Diesel oil would give off 10500 kcal/kg when burned. Scrambled eggs give off 2100 kcal/kg. If you divide 10500/2100, you find that you would need 5 kilograms of scrambled eggs. Answer D.
4. Heat of combustion for white bread is 2600 and for ice cream is 2100. The heat of combustion for rye bread must fall between these two values. Answer G is correct.
5. The lowest heat of combustion for any fuel is for Pine Wood at 4500. The heats of combustion for the three foods are as follows: Butter, 7950; Peanuts, 5640; and Cooked Rice, 1120. The only food that has a heat of combustion lower than 4500 is Cooked Rice. Answer A, III only, is correct.

Passage II

6. From Table 1, the percent of algae corresponding to a population density of 100 is 2.70. Answer H.
7. From Table 2, it is apparent that there is a positive linear relationship between industrial concentration and algae. Answer A presents the correct graphic representation.
8. From Table 2, it appears that, as industrial concentration increases from 1 to 2, the percent of algae doubles, from about 1.20 to 2.45. Similarly, as industrial concentration increases from 2 to 3, the percent of algae doubles again. Thus, we would project that an industrial concentration of 4 would have double the concentration, or about 10 percent (5 x 2). Answer J.
9. This question requires you to compare values from both Table 1 and Table 2. The closest values are from Experiment 1, Site Three (1.35) and Experiment 2, Site One (1.20). Answer B.
10. From Table 1, a percent of algae of 5.20 is closest to a population density of 1000. From Table 2, a percent of algae of 5.20 is closest to an industrial concentration of 3. Thus, this percent of algae could have come from either site. Answer J.
11. From Table 1, we know that the percent of algae increases as the population density increases. From Table 2, we know that the percent of algae increases as industrial concentration increases. Could these two factors be related? Could sites with a high population density also have high industrial concentrations? Answer C would help us determine which is the most important factor causing the percent of algae to increase.

Passage III

12. The first paragraph indicates that “Fuels with octane ratings greater than 100 have superior antiknock properties.” Using Table 1, the engine compression ratio that would require an octane rating of greater than 100 is a ratio of 12:1. Answer J.
13. From Table 2, Trimethylpentane has an octane number of 100 without TEL and 115.5 with TEL. Thus, TEL improves the octane number by approximately 15. Answer A.
14. Using Table 2 again, the difference in octane number for each hydrocarbon is as follows: *n*-Butane (8.0); *n*-Pentane (27.0); and 2-Methylbutane (9.4). Only *n*-Pentane improves its octane number by at least 10. Answer G.
15. Using Table 2, the difference in octane for each hydrocarbon is as follows: *n*-Hexane (40.5); *n*-Heptane (43.5); *n*-Octane (44.0); and Isopropylbenzene (3.7). The largest improvement in octane number occurs for *n*-Octane. Answer C.
16. From Table 1, an engine compression ratio of 12:1 has an octane number required of 102. From Table 2, four of the hydrocarbons have an octane number above 102 after adding TEL. Answer G.

Passage IV

17. The rotation period for the Earth is 1 day, and for Neptune 0.6 days. The difference is .4. Answer A.
18. Looking at the columns for both Venus and Earth, the Earth has larger values for the variables listed except for surface temperature (Earth = 285 and Venus = 750). Answer J.
19. The length of the year on the Earth is 1, compared with 687 days for Mars. Using 365 days for the average Earth year, the length of the year on Mars is 322 days longer. Answer A.
20. Using the variables of distance and surface temperature and looking across the rows of data, it seems that as the distance from the Sun increases, the average surface temperature decreases. Answer G.

21. Using the variables of velocity of escape and mass and looking across the rows of data, it seems that as the mass increases the velocity of escape increases. Answer A.

Passage V

22. Scientist 1 notes that the greater the Earth's tilt, the more the glaciers retreat. Thus, a lower tilt would contribute to a glacial advance. Furthermore, Scientist 1 notes that a circular orbit means less sunlight and this orbit would contribute to glacial advances. The best option is Answer F.
23. According to Scientist 2, calcium silicate "reacts with carbon dioxide in such a way as to remove it from the atmosphere." Answer A is the best choice.
24. Scientist 1 argues that changes in the Earth's orbit combined to produce conditions that led to glacial advances. The introductory paragraph states that glaciers advanced significantly, enough so to cover large parts of the Earth. If answer H were true, Scientist 1's argument would be significantly weakened. If changes in Earth's orbit could only cause glacial advances of 50 miles, these changes could not account for the Ice Age.
25. Scientist 2 is arguing that a decrease of carbon dioxide in the atmosphere triggers colder weather. Answer D would strengthen Scientist 2's argument by providing confirmation that carbon dioxide levels were low in the Cenozoic period.
26. One way to consider what factor might weaken Scientist 2's argument is to consider what factor might strengthen Scientist 1's argument. Answer F would greatly strengthen Scientist 1's argument.
27. Both scientists disagree on options C and D. There is no evidence for how Scientist 1 feels about option A. However, both scientists agree with answer B that changes to the Earth (whether they are orbital changes or tectonic shifts) can produce dramatic shifts in climate.
28. Scientist 1 argues that orbital changes combined to trigger a "massive, rapid advance of the glaciers." Scientist 2 notes that the erosion occurred over a period of millions of years. Thus, it seems that the two Scientists would disagree over answer H.

Passage VI

29. Mouse 1 was injected first with killed poliovirus and then with live poliovirus. Mouse 2 was injected first with killed influenza virus and then with live influenza virus. Answer C is the best summary of this result: that a specific killed virus can defend against a live virus of the same strain.
30. Mouse 5 was injected with a serum solution and this solution defended against the live poliovirus. Answer G.
31. Mouse 8 was injected with a cell solution and this solution defended against the live influenza virus. Answer A.
32. Combining the results from questions 29-31, it seems that answer J is the best choice: that specific parts of blood defend against specific viruses.
33. From Experiment 1, we know that killed influenza virus will protect against live influenza virus. From Experiment 3, we know that a cell solution will also protect against live influenza virus. Answer C.
34. It seems that an injection of a specific killed virus will only defend against a live version of the same virus. An injection of live Hepatoid C would probably kill both mice. Answer J.

Passage VII

35. Using Figure 1, the global temperature will have increased 14 degrees after 100 years based on the $2 \times \text{CO}_2$ model. Answer B.
36. Using Figure 2, the sea level will rise 80 cm after 100 years based on $2 \times \text{CO}_2$ model. Answer F.
37. Using Figure 1, the temperature rise after 400 years for the $2 \times \text{CO}_2$ model is 14 degrees and for the $4 \times \text{CO}_2$ model it is 18 degrees. The difference is 4 degrees. Answer B.
38. Using Figure 2, both models agree on an 80 cm rise after 100 years. Answer F.
39. Using Figure 1, it seems that the ratio from the two models remains constant starting at about 200 years from the present. Answer C.
40. Extrapolating from Figure 1, the temperature rise after 600 years would be the same as after 400 years under the $4 \times \text{CO}_2$ model. This rise would be 18 degrees. Extrapolating from Figure 2, the sea level rise after 600 years would be approximately 200 cm under the $4 \times \text{CO}_2$ model. Answer G.