

Form 1460

English Test

1. Answer: D. *E113 Short and Simple*

As the sentence already uses the verb *kneeling*, it's redundant to also state *on their knees*. Omission is very commonly the correct answer, so always give special note to the option to omit.

2. Answer: H. *E105 Pronouns: Agreement/Case*

As the sentence is in present tense, it's simple and correct to just go subject-predicate with no fancy punctuation.

3. Answer: D. *E103 Independent Clauses: Period, Semicolon, Comma and FANBOYS; E114 Transition Words/Phrases*

In order for this sentence to make sense, the first clause must be a dependent one. We can determine this from the lack of conjunction after the comma. As it is, it is two improperly joined independent clauses. The option *Before* creates a dependent clause which introduces the following independent clause.

4. Answer: F. *E101 Verbs: Agreement/Tense*

The word *has* should clue you in to the correct answer. *Has taken* is the only viable combination of options; **H** and **J** both include a second *had*, and **G** would form the incorrect *had took*.

5. Answer: C. *E106 Apostrophes: Possessive, Plural, Contractions*

Without an apostrophe, *Its* is possessive, which clearly does not fit in the sentence. Option **B** is a nonexistent word-chimera, and though **D** is grammatically correct it is in the wrong tense for the story.

6. Answer: F. *E113 Short and Simple*

The use of *up* in all three options is what rules them out. The word *altitude* already states that it is a matter of height, so adding *up* is redundant and, thus, incorrect.

7. Answer: B. *E103 Independent Clauses: Period, Semicolon, Comma and FANBOYS*

Assessing the clauses as separated after the word *roar* leads to the understanding of what punctuation is necessary. Up to *roar*, we have an independent clause. After, the word *that* creates a dependent clause with no predicate. We can determine, then, that as the sentence is not compound we do not need to conjoin in any way.

8. Answer: G. *E110 Relevancy: Adding, Deleting, and Replacing Information*

The most correct answer will be one which clearly emphasizes the *growing sense of nervousness*, also known as suspense. Options **F** and **H** are boring and offer no dramatic or suspenseful imagery. **J** is very much the opposite of what is asked for, instead discussing the *good time*, being had. **G** is appropriately suspenseful and fits well at the numbered position.

9. Answer: D. E117 Moving Sentences

The rest of the paragraph follows the chronological series of events leading up to the jump. It makes the most sense to place the jump at the end, rather than before any of the preceding steps are completed.

10. Answer: H. E102 Commas

Do not be confused by the repetition of *you* in this sentence; there is still only one subject and predicate. The root of this sentence is *You think*. The addition is only to specify *what* you think. As it is a simple sentence, there is no additional punctuation needed.

11. Answer: B. E114 Transition Words/Phrases

This can be a trickier question, as it is a matter of understanding each transition word's implications. **C** and **D** both imply a cause-and-effect relationship, while **A** would mean the following sentence reinforces the preceding thought. While not grammatically incorrect, the change described just after gives context which disproves that relationship; slowing down would not make you feel more sick, but less.

12. Answer: H. E112 Word Choice: Tone

This question asks for the option with the most *violent action*. This should immediately point you in the direction of the action verb. The options are tightens/becomes taut & opens/yanks. While the first verb is fairly lackluster, *yank* is a descriptive verb which accurately portrays the *violent* action of the parachute.

13. Answer: A. E102 Commas

It should be clear after a brief look that this sentence does not need a comma in the underlined portion, because there's nothing to separate. Though you may be tempted to use an exclamation mark, note that they are almost always unnecessary (thus, incorrect) unless someone is actually yelling in the text. They are considered improper, and should generally be avoided in these passages unless something is clearly meant to be emphasized.

14. Answer: J. E114 Transition Words/Phrases

There's no need to include a transition here because the appreciation and accomplishment mentioned just before do not impact the following sentence's factual statement.

15. Answer: A. E110 Relevancy: Adding, Deleting, and Replacing Information

Nobody said it had to be good writing. The important part here is to indicate the *relaxed* feeling. **B** is not relaxed, but anxious. **C** does not convey this feeling at all, although it fits the sentence well. **D** is in a strange position of not-quite-relaxed yet not-quite-anxious, and in any case does not offer the assurance of option **A**.

16. Answer: J. E113 Short and Simple

The underlined phrase is unnecessary. There is no reason to restate that something is true unless we have reason to believe otherwise. In this case, especially as it's the first sentence, we have no such reason. It can and should be deleted.

17. Answer: C. E102 Commas

The easiest answers to eliminate are **A** and **D**, because one can tell without much trouble that there does not need to be a comma after *impatient*. **B** and **C** are similar, but the extra comma after *tinny* in **B** actually causes *notes* to lose its properties as a noun being described. Reading this aloud and trying to hear the pauses is a good strategy.

18. Answer: J. E105 Pronouns: Agreement/Case

When omission is an option, always look to see if it works. Does the sentence sound correct without the underlined portion? In this case it does, and is correct. The most tempting distractor answer is **G**, which is incorrect however because the *after* at the start makes it redundant to include *then*.

19. Answer: C. E101 Verbs: Agreement/Tense

The word *would* in this sentence is the clue, as *would go* is the only correct way to put it. However, the answers can also easily be narrowed down because *would of* is ALWAYS incorrect. *Would have* is the actual phrase, so any time you see *would of* you can immediately cross it off.

20. Answer: G. E103 Independent Clauses: Period, Semicolon, Comma and FANBOYS

This portion attempts to combine two independent clauses without a conjunction. The sentences can be separated after *B.C.* for the simplest correct answer. Do not be fooled by the changing of words following it, because the key is the punctuation. **H** is wrong, however, because *an* is less specific than *this*.

21. Answer: C. E110 Relevancy: Adding, Deleting, and Replacing Information

All of these options are redundant and unnecessary as they have been stated before and serve no purpose being restated here.

22. Answer: F. E110 Relevancy: Adding, Deleting, and Replacing Information

The harmonica is the subject of only answer **F**; the other answers instead discuss London, the difficulty of playing the harmonica, and Franklin's inventions. None of these answer the question.

23. Answer: D. E108 Adjectives and Adverbs

The grammatical rules for this question are tricky, so you may find it easier to just consider what sounds right. Try inserting the word in all the mentioned places and reading them aloud; you should find that one sounds noticeably worse. Don't be confused by the question's tricky wording and *after* placement. Just take it slow and think it through!

24. Answer: F. E103 Independent Clauses: Period, Semicolon, Comma and FANBOYS

The word *while* at the start informs us that the two independent clauses need to be combined, as well as serving as the conjunction. Only a comma is necessary, because the first clause becomes dependent due to the *while* preventing a semicolon.

25. Answer: A. E110 Relevancy: Adding, Deleting, and Replacing Information

The only answer which provides a logical transition is **A**, which references both the history above and the return to the narrative below. The others are not relevant, nor do they serve as transitions.

26. Answer: H. E105 Pronouns: Agreement/Case

Whom is not correct here as there is no preposition. *Did* does not agree with the verb *performed*. The only logical, correct answer is **H**, which properly says he *had performed*.

27. Answer: B. E102 Commas; E103 Independent Clauses: Period, Semicolon, Comma and FANBOYS

The number of commas here can make it confusing to read, however if you dissect the sentence it makes more sense. The correct commas are before *but*, a conjunction from FANBOYS which must be followed with a comma, and between the descriptors *pure* and *sad*, which must be separated so they are not describing one another. The extra comma at the end looks enticing, but in reality separates *that* and *the* which are a pair. This is a difficult question, so try reading and listening for natural pauses.

28. Answer: J. E117 Moving Sentences

The *however* in sentence 4 is the clue here, because it implies that something unexpected is going to come next. Similarly, the fact that sentence 2 begins with *When we had finished* while the underlined sentence ends with *when he'd finished* is a signal that it is incorrect and redundant as is.

29. Answer: B. E113 Short and Simple

All of the options here, regardless of technical correctness, simply add extra words for no real gain. Simply *and* is correct and appropriate without all the extra nonsense.

30. Answer: J. E110 Relevancy: Adding, Deleting, and Replacing Information

Remember to always pay special attention to omissions, because they are often correct. Here it is, because the fact it was a Wednesday offers no relevant information to the text.

31. Answer: B. E113 Short and Simple

Again, the extra phrases are all synonymous to *spoke*, so there's no reason to say them in its place.

32. Answer: J. E113 Short and Simple

This omission is another correct one. The word *originally* is redundant because *first* is used earlier in the sentence, so there is no need to repeat the information.

33. Answer: A. E102 Commas

Don't be tempted by all the comma options here! The sentence is correct as is, with no comma. There are no clauses to separate, as there is only one independent clause. The presence of two verbs (*said* and *were*) does not impact this.

34. Answer: G. E120 Parallel Structure

The series of questions here form a loose list, and as such should not be split further. Instead, they should remain together for full rhetorical effect. Similarly, there is no reason to begin a new paragraph either way; a new topic is not introduced, but rather an existing one expanded upon.

35. Answer: D. E114 Transition Words/Phrases

Nonetheless implies something done regardless of the aforementioned. *Otherwise* loosely means *or else*. *While* implies simultaneous action. None of these pertain to the phrase's continued use, so it is best to omit them and simply start with *We*.

36. Answer: F. E110 Relevancy: Adding, Deleting, and Replacing Information

G is false because it is not irrelevant; it provides information directly related to the passage. **H** is incorrect because the detail does not serve to transition, as it is not related to Iago. **J** is closer in that it recognizes a detail, but it does not contradict the topic sentence at all, but rather reinforces it. **F** is correct and relevant.

37. Answer: C. E104 Nonessential Information: Commas, Dashes, Parentheses

The clause denoting Iago as the villain should be housed between two commas because it is not essential to the sentence, but rather an extra detail to clarify. As such, there should not be a comma between because it would then become unclear where that detail begins and ends.

38. Answer: J. E106 Apostrophes: Possessive, Plural, Contractions

Even though there is a comma to trick you, only one answer has a correct apostrophe. The possessive, singular noun *Othello* should be followed with apostrophe-s.

39. Answer: A. E101 Verbs: Agreement/Tense

C and **D** both offer the incorrect present tense, while **B** offers the incorrect pairing *had became*. If it said instead *had become*, it would be viable. Only the existing *became* is correct in agreement and tense.

40. Answer: J. E110 Relevancy: Adding, Deleting, and Replacing Information

This sentence does not pertain to the paragraph. The modern film's success is irrelevant to the modern phrases the play reared. Omission, as usual, is correct.

41. Answer: C. E101 Verbs: Agreement/Tense

Note that here it is not correct to omit. The distractor answer is **B** which seems to use a colon properly, however *included* is in the wrong tense, as it does not agree with *have preserved* in the present tense. *Include* is the only correct, present option.

42. Answer: J. E111 Word Choice: Correct Word

The correct preposition here is *to*, as one does not *allude of* something. Do not be confused by the homophone *illusions*! No sleights of hand nor optical tricks to be found here.

43. Answer: B. E101 Verbs: Agreement/Tense

The fact that it specifies *one* Star Trek movie means the verb *must* be singular to match. *Is* is the singular verb, and the commas and other additions don't offer a correct verb.

44. Answer: H. E102 Commas

Don't be tricked into thinking this is a run-on; it's just a long sentence. Because *speech and popular culture* are only two articles, there is not a list and thus there needn't be a comma between them. There are no clauses separated in the underlined portion, so no comma is necessary.

45. Answer: C. E110 Relevancy: Adding, Deleting, and Replacing Information

Answer **B** is tempting, but look closely! It doesn't refer to a *main theme in the essay*, which is focused on Shakespeare's influence on language. While **C** is an odd concluding sentence, it does refer to the matters mentioned in the prompt.

46. Answer: F. E114 Transition Words/Phrases

Although this clause is a little strange, it is not incorrect as the others are. **G-J** all present independent clauses, which cannot be joined with only a comma. Only the original is correctly dependent.

47. Answer: B. E104 Nonessential Information: Commas, Dashes, Parentheses

The inclusion of Maya's name is not essential to the sentence structure, but rather a clarifying detail. As such, it is included between two commas to denote its purpose.

48. Answer: J. E110 Relevancy: Adding, Deleting, and Replacing Information

While all the answers are general, the only option which addresses the *features* of the monument is answer **J**.

49. Answer: A. E103 Independent Clauses: Period, Semicolon, Comma and FANBOYS

Although *While* is not part of FANBOYS, it does serve to create a dependent clause out of the beginning of the sentence. As such, it can be connected to the following independent clause with only a comma.

50. Answer: G. E110 Relevancy: Adding, Deleting, and Replacing Information

Remember that the *yes* and *no* in these questions are not what is important, but rather the supporting evidence. **F** incorrectly states the sentence is in opposition to the subject matter, while it is still relevant to public sculpture. **H** and **J** both provide shallow evidence which does not effectively reinforce the *Yes* option. **G**, however, accurately points out the lack of value gained from adding the proposed sentence.

51. Answer: A. E101 Verbs: Agreement/Tense

The only option which matches the sentence is *has applied*, as the others are incorrect in tense/agreement.

52. Answer: G. E110 Relevancy: Adding, Deleting, and Replacing Information

Read ahead! The correct answer references *later in the essay*, and without checking this there is no way to know it is correct. If you do look, you can immediately rule out **F**. **H** is wrong because the sentence is not about the memorial itself, but rather her work since. **J** incorrectly claims this undermines the paragraph, despite no evidence that this is true.

53. Answer: B. E115 Modification: Dangling Modifiers

As-written, the beginning of the sentence is modifying *May Lin*, not *this work*. Because it is the work which is supposed to be located in Alabama, it must be the subject. This is only the case for option **B**.

54. Answer: J. E110 Relevancy: Adding, Deleting, and Replacing Information

This sentence should immediately stand out as irrelevant, as it offers nothing to the text. **F-H** incorrectly identify qualities nonexistent in the statement in question, which is out of place and ought to be deleted.

55. Answer: C. E106 Apostrophes: Possessive, Plural, Contractions; E101 Verbs: Agreement/Tense

One can easily rule out a number of answers by looking carefully at errors in the answers themselves. For example, *their* is plural, while *a granite wall* is singular, so this is not correct. Similarly, *it's* is not possessive, but the contraction for *it is*. *Which* simply doesn't make sense. Only *this* agrees with the sentence as a whole.

56. Answer: J. E110 Relevancy: Adding, Deleting, and Replacing Information

The additional details are important because they add to the text. In this case, we cannot omit them for the sake of conciseness. **J** is correct because it provides the information from both **G** and **H** in a simple, concise way.

57. Answer: B. E110 Relevancy: Adding, Deleting, and Replacing Information

Note that the sentence in question is quite far up on the page; don't be confused by this, as it still pertains to this part of the text. This sentence is best matched to **B's** *comparison between Maya Lin and other Sculptors*. It does not criticize her shortcomings, nor give reason for her medium, nor offer potential influences, as the others would suggest.

58. Answer: F. E113 Short and Simple

These options do not offer anything to the sentence except unneeded complexity. You are better off foregoing them and sticking with the straightforward option.

59. Answer: C. E101 Verbs: Agreement/Tense

The reason for *are* instead of *were* here is because the places listed are both still in existence and still influenced. As she does not cease to be influential in their creation, they are referred to in the present tense.

60. Answer: H. E119 Writer's Goal

Always keep in mind that the affirmative/negative is not important; only the evidence is. **H** is correct because it accurately explains *why* it would not fulfill the goal while accurately referencing the text, which the others fail to do.

61. Answer: C. E103 Independent Clauses: Period, Semicolon, Comma and FANBOYS

Using *but*, as seen in FANBOYS, allows us to stick with only the comma before the underline. *However* would cause 2 improperly joined independent clauses, as would *even so*. Note that omission is not correct this time.

62. Answer: F. E111 Word Choice: Correct Word

The correct preposition is *of* because it describes what she was chronicling—not with what, for what, or on what, as in the other answers.

63. Answer: C. E114 Transition Words/Phrases

The word that should be a hint here is *that*, which tells us there must be something earlier on to which *that* references. The prepositional phrase starting with *while* and *during* prevents this, so only option **C** which creates a subject (to be *that*) is correct.

64. Answer: G. E112 Word Choice: Tone

It should be clear that *hook up again* is too informal for this passage, so one must look for the most similar option provided. Only *reconnect* provides the same implication of earlier connection.

65. Answer: A. E111 Word Choice: Correct Word

The date immediately following the underlined portion should serve as a very strong hint that a reference to time is appropriate here. As such, *when* is the most correct and logical answer.

66. Answer: H. E105 Pronouns: Agreement/Case

Including both *them* and *they* with no clear antecedent in the sentence is too vague to be correct. Only *people*, though still vague, provides some context for the following *they*. Note that omission is incorrect here.

67. Answer: D. E113 Short and Simple

This detail is unnecessary because in the sentence just before we are already told she was headed to her hometown. This redundancy warrants omission.

68. Answer: F. E101 Verbs: Agreement/Tense

G and **J** are incorrectly in the present tense, while we know from *went* that this section is past tense. **H** is in the future tense, which is also incorrect.

69. Answer: A. E110 Relevancy: Adding, Deleting, and Replacing Information

The reasoning provided in answer **A** is valid because, indeed, the passage does not explain why she visited that porch (a relevant detail). The other explanations and details do not accurately describe the reasoning.

70. Answer: J. E101 Verbs: Agreement/Tense

Begun can never be used by itself. It will always be in conjunction with another word to indicate tense, such as *had*. **H** improperly pairs this with *began*, and **G** uses the incorrect *would*. Only a lone *began* is correct.

71. Answer: D. E113 Short and Simple

All of the options except **D** are simply redundant. There is no reason to use two words which both mean *large amount*.

72. Answer: H. E111 Word Choice: Correct Word

The option *much more* is incorrect due to the distinction between quantity and volume, commonly distinguished in *less* versus *fewer*. There are many individual stories, rather than *stories* being an abstract concept with a functional volume.

73. Answer: B. E110 Relevancy: Adding, Deleting, and Replacing Information

The question asks for the *clearest and most precise preview*, so we know to look for the least vague option. All of them are equally vague except for **B**, which actually refers to their content.

74. Answer: J. E108 Adjectives and Adverbs

Accounts is a noun, so it can not be modified by an adverb (hint: ending in -ly). This rules out every answer except J. Another possible combination would be *humorously exaggerated*, but it is not presented as an option.

75. Answer: B. E102 Commas

There is no need for a comma here as there are only two examples presented, so we do not have a list. There are no clauses being separated here, either, so we can be sure there is no need for a comma.

Mathematics Test

1. Answer: D. M201 Algebraic Operations

$$(4 - 2 \times \frac{1}{2})(4 + 2 \times \frac{1}{2})$$
$$(3)(5)$$

D. 15

2. Answer: J. M110 Percent

80% of 40 points

$$(.8)(40) = 32$$

J. 32

3. Answer: D. M217 Factoring & FOIL

$$(2x - 3)(3x - 4)$$

FOIL

$$6x^2 - 8x - 9x + 12$$

D. $6x^2 - 8x - 9x + 12$

4. Answer: J. M503 Probability

Probability of NOT happening is $1 - \frac{2}{9}$

$$\frac{9}{9} - \frac{2}{9} = \frac{7}{9}$$

J. $\frac{7}{9}$

5. Answer: B. M109 Rate & Proportion

$$\frac{4.5}{50} = \frac{x}{80}$$
$$x = 2.4$$

B. 2.4

6. Answer: F. M212 Linear Function: Rate

$$36 - 0.48t$$

F. $36 - 0.48t$

7. Answer: C. M302 Triangles

$$70 + 2x = 180$$
$$2x = 110$$
$$x = 55$$

C. 55

8. Answer: H. M303 Quadrilaterals

1. $2 \times 8 = 16$
2. $1 \times 4 = 4$
3. $2 \times 20 = 40$
4. $1 \times 5 = 5$

$$\frac{65 \text{ square feet}}{10 \text{ sq/bg}} = 6.5$$

H. 7

9. Answer: D. M214 Functions $f(x)$

Find the x values.

D. $\{0, 2, 3\}$

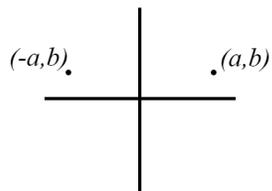
10. Answer: F. M112 Logic

lights on \rightarrow *store open*

converse

F. *store open* \rightarrow *lights on*

11. Answer: A. M208 Coordinate Geometry & XY-Plane



A. $(-a, b)$

12. Answer: K. M201 Algebraic Operations

$$\begin{aligned} & x^2 + 5x + 1 \\ - & (4x^2 + x - 5) \\ \hline & -3x^2 + 4x + 6 \end{aligned}$$

K. $-3x^2 + 4x + 6$

13. Answer: B. M109 Rate & Proportion

$$\begin{aligned} \frac{\$1.99}{5} &= .398 \\ \frac{\$2.19}{5} &= .438 \\ .438 - .398 &= .04 \end{aligned}$$

B. \$0.04

14. Answer: F. M202 Solving Equations

$$12x = -8(10 - x)$$

$$12x = -80 + 8x$$

$$4x = -80$$

$$x = -20$$

F. - 20

15. Answer: B. M110 Percent

$$414 = (1.15)x$$

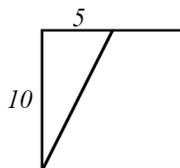
$$x = \frac{414}{(1.15)}$$

B. \$360

Note: Estimate and look at the answers.

- A. stupidly low
- C. $414 - 15 =$ not
- D./E. too high

16. Answer: J. M308 Multiple Figures



Big - Small

$$(10 \times 10) - \frac{1}{2}(10)(5)$$

$$100 - 25 = 75$$

J. 75

17. Answer: D. M210 Systems of Equations

Use elimination.

$$x + 2y = 12$$

$$x - y = 3$$

$$x + 2y = 12$$

$$-(x - y = 3)$$

$$3y = 9$$

$$y = 3$$

D. 6, 3

18. Answer: H. M214 Functions $f(x)$

$$f(x) = 2x$$

$$g(x) = x^2$$

$$f(g(31))$$

$$g(3) = 3^2 = 9$$

$$f(9) = 2(9) = 18$$

H. 18

19. Answer: E. M504 Counting, Permutations, & Combinations

$$5 \times 4 \times 5 = 100$$

E. 100

20. Answer: H. M203 Inequalities

$$-5 + m \leq -4 + 2m$$

$$-5 \leq -4 + m$$

$$-1 \leq m \text{ or } m \geq 1$$

H. $m \geq 1$

21. Answer: B. M104 Fractions

Use your calculator and turn them all into decimals.

$$\frac{1}{3} = .333\bar{3}$$

$$.28$$

$$\frac{2}{5} = .4$$

$$\frac{3}{8} = .375$$

$$.37$$

$$\frac{3}{10} = .3$$

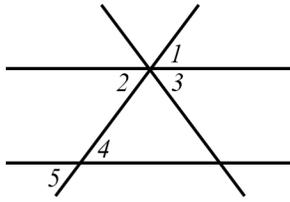
B. .28, .3, $.3\bar{3}$, .37, .375, .4

22. Answer: F. M205 Exponents & Roots

$$(3x^3)^{-2}$$

F. $\frac{1}{9x^6}$

23. Answer: C. M301 Lines & Angles



Congruent: 1, 2, 4, 5

C. $\angle 2$ and $\angle 3$

24. Answer: G. M206 Logarithms

$$A = 10^{B+C}$$

$$A = B + C$$

G. $B + C$

25. Answer: B. M202 Solving Equations

$$4x^2 - 9 = 0$$

$$(2x - 3)(2x + 3) = 0$$

$$2x - 3 = 0$$

$$2x = 3$$

$$x = \frac{3}{2}$$

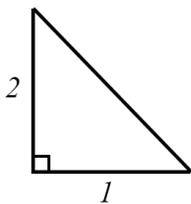
$$2x + 3 = 0$$

$$2x = -3$$

$$x = -\frac{3}{2}$$

B. $\{-\frac{3}{2}, \frac{3}{2}\}$

26. Answer: G. M302 Triangles



$$C^2 = 1^2 + 2^2$$

$$C^2 = 5$$

$$C = \sqrt{5}$$

G. $\sqrt{5}$

27. Answer: B. M211 System Word Problems

$$\text{Lehman : } \$30 + \$22(h)$$

$$A - 1 : \$35 + \$20(h)$$

$$30 + 22(h) = 35 + 20(h)$$

$$2h = 5$$

$$h = \frac{5}{2}$$

B. $\$2\frac{1}{2}$ hours

28. Answer: H. M207 Linear Functions: $y = mx + b$

$$m = \frac{y_2 - y_1}{x_2 - x_1} = \frac{(5-3)}{(-3-7)} = \frac{2}{-10} = -\frac{1}{5}$$

H. $-\frac{1}{5}$

29. Answer: C. M106 Sequence

$$4 \quad 4n \quad 4n^2 \quad 256$$

$$\begin{array}{cccc} 256 & = & 4n^3 & \\ \div 4 & & \div 4 & \end{array}$$

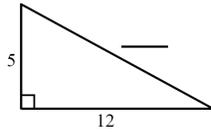
$$64 = n^3$$

$$n = 4, \text{ second term is } 4n \text{ or } 4(4) = 16$$

C. 16

30. Answer: H. M302 Triangles

Double Sides



This is a standard right triangle 5-12-13

H. 13

Tip: Learn the common Pythagorean triples so you don't have to waste time using the Pythagorean Theorem: 4-5-6, 5-12-13, and whole-number multiples of those triples

31. Answer: D. M201 Algebraic Operations

$$3x + a = 9$$

$$3x = 9 - a$$

$$x = \frac{9-a}{3}$$

D. $\frac{9-a}{3}$

32. Answer: J. M213 Distance/Rate/Time; M104 Fractions

To solve, convert all fractions to decimals.

The longest distance in the same time ran the fastest speed.

J. $\frac{7}{9}$

33. Answer: C. M207 Linear Functions: $y = mx + b$

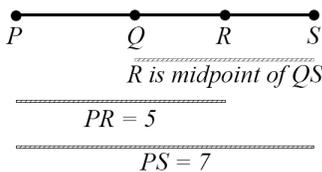
The answers are in standard form. Simply plug in the given points for answers. Easiest number to plug in is always zero!

$$3(0) - 4(0) = 0$$

Only C. works

C. $3x - 4y = 0$

34. Answer: H. M301 Geometry Lines



$$PS - PR = SR$$

$$7 - 5 = 2$$

$$QS = 4$$

H. 4

35. Answer: E. M217 Factoring & FOIL

$$3x^4 + 6x^2 - 45$$

$$3(x^4 + 2x^2 - 15)$$

$$3(x^2 + 5)(x^2 - 3)$$

E. $3(x^2 + 5)(x^2 - 3)$

36. Answer: G. M109 Rate and Proportion

$$1 \text{ cm} = 4 \text{ miles}$$

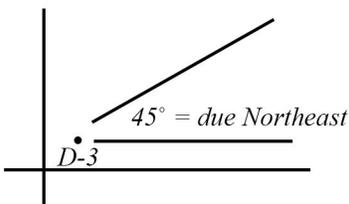
$$2\frac{1}{2} \text{ cm} = ?$$

$$\frac{2.5 \text{ cm}}{1 \text{ cm}} = \frac{x \text{ miles}}{4 \text{ miles}}$$

$$x = (2.5)(4)$$

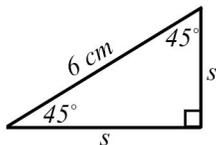
G. 10 miles

37. Answer: D. M208 Coordinate Geometry & XY-plane



$$\frac{24 \text{ miles}}{4 \text{ miles}} = 6 \text{ cm}$$

This is a 45 - 45 - 90 triangle.



$$6 \text{ cm} = s\sqrt{2}$$

$$\frac{6}{\sqrt{2}} = s$$

$$4.24 = s$$

Go 4.24 from D to H and from 3 to 7

D. H - 7

38. Answer: F. M109 Rate and Proportion

$$\frac{1 \text{ cm}}{4 \text{ mi}} = \frac{x \text{ cm}}{2 \text{ mi}}$$

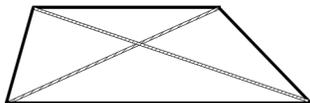
$$x = \frac{1}{8} \text{ cm per side}$$

$$\text{Area} = \frac{1}{8} \text{ cm} * \frac{1}{8} \text{ cm} = \frac{1}{64}$$

F. $\frac{1}{64}$

39. Answer: E. M303 Quadrilaterals

Note: A rectangle, rhombus, and a square are all parallelograms which by definition have diagonals that bisect each other. A trapezoid may not have diagonals that bisect each other.



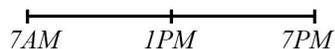
E. trapezoid

40. Answer: J. M103 Properties of Integers

Every four hours



Every six hours



Note*: The LCM of 4 and 6 is 12.

$$7AM + 12 \text{ hours} = 7 PM$$

J. 12

41. Answer: B. M506 Tables

Most games AWAY from home.

To solve take the Wins and subtract the home wins.

92	88	85	74	53
$\frac{-49}{43}$	$\frac{-43}{43}$	$\frac{-47}{38}$	$\frac{-35}{39}$	$\frac{-29}{26}$

B. Baltimore

42. Answer: F. M202 Solving Equations

Substitute

$$(1)^2 + h(1) + 10 = 0$$

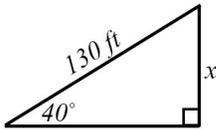
$$1 + h + 10 = 0$$

$$h + 11 = 0$$

$$h = -11$$

F. - 11

43. Answer: A. M401 SOHCAHTOA

$$\text{S} \frac{\text{O}}{\text{H}} \text{C} \frac{\text{A}}{\text{H}} \text{T} \frac{\text{O}}{\text{A}}$$


$$\sin 40 = \frac{x}{130}$$

$$130 \sin 40 = x$$

$$x = (130)(.643) = 78$$

A. 80**44. Answer: F. M308 Multiple Figures**

$$\text{small} : \pi r^2 = 4$$

$$r = 2$$

$$\text{big} : \text{radius} = 5 * 2 = 10$$

$$\text{area of large } \pi r^2 = \pi(10)^2 = 100\pi$$

F. 100π**45. Answer: A. M205 Exponents & Roots**

$$\sqrt[3]{27r^6} = \sqrt[3]{27} \sqrt[3]{r^6} = 3r^2$$

A. 3r²**46. Answer: K. M106 Sequence**

(1, 2, 3, ..., 10) is the same as

(1, 2, 3, 4, 5, 6, 7, 8, 9, 10)

The sum of the cubes of the counting numbers is equal to the square of the sum of the counting numbers.

K. (1 + 2 + ... + c)²

Tip: Ellipsis (three periods or dots: "...") means every counting number between the two numbers on either side.

47. Answer: B. M307 Solids

radius of Uranus: r_u

radius of Earth: r_e

$$r_u = 4r_e$$

$$\text{volume of } r_u = \frac{4}{3}\pi(4r_e)^3$$

$$= \frac{4}{3}\pi(64r_e^3)$$

Volume of Uranus is 64 times that of Earth.

B. 64

48. Answer: H. M501 Mean, Average

$$\frac{(a+a+a+b+c)}{5} = a$$

$$3a + b + c = 5a$$

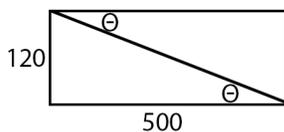
$$b + c = 2a$$

$$\frac{b+c}{2} = a$$

H. a

49. Answer: E. M401 SOHCAHTOA

S
H C A T O
H H A A



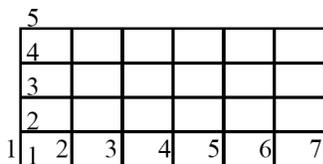
E. $\tan\theta = \frac{120}{500}$

50. Answer: H. M308 Multiple Figures

Draw:

4 cm requires 5 horizontal lines.

6 cm requires 7 vertical lines.

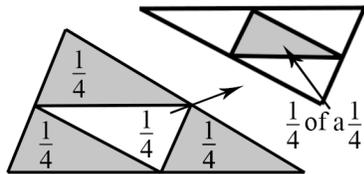


5 lines x 6 spaces = 30 line segments

7 lines x 4 spaces = 28 line segments

Total = 58 line segments

H. 58

51. Answer: E. M308 Multiple Figures

$$\frac{1}{4} + \frac{1}{4} + \frac{1}{4} + \left(\frac{1}{4} \text{ of } a \frac{1}{4}\right) = \frac{4}{16} + \frac{4}{16} + \frac{4}{16} + \frac{1}{16} = \frac{13}{16}$$

E. $\frac{13}{16}$

Tip: Midpoints of the three sides of a triangle, when connected, form four sections of equal area.

52. Answer: K. M208 Coordinate Geometry & XY-Plane1. Midpoint of x and y .

$$\left(\frac{20+120}{2}\right), \left(\frac{100+40}{2}\right)$$

 $(70, 70)$ 2. Distance from booth to y .

$$\sqrt{(100 - 70)^2 + (110 - 70)^2}$$

K. 50**53. Answer: A. M216 Quadratics & Parabolas**

$$h = -t^2 + 3t$$

Tip: Vertex of any parabola $ax^2 + bx + c = 0$ is $\frac{-b}{2a}$

$$\frac{-b}{2a} = \frac{-3}{2(-1)} = \frac{3}{2}$$

A. $\frac{3}{2}$ **54. Answer: K. M201 Algebraic Operations**Find LCD = $(x + 1)(x)$

$$\frac{(x)}{(x)} \times \frac{1}{(x+1)} + \frac{(x+1)}{(x+1)} \times \frac{1}{x} = \frac{2x+1}{(x)(x+1)}$$

G. $\frac{(2x+1)}{(x)(x+1)}$ **55. Answer: D. M303 Quadrilaterals; M108 Ratio**

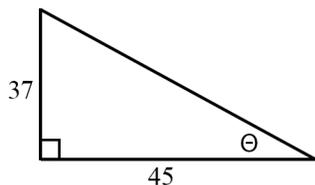
1 : 2 : 3 : 4 = 10 total parts

$$\times 36 \quad \times 36$$

$$144 \quad 360 \text{ total degrees}$$

D. 144°

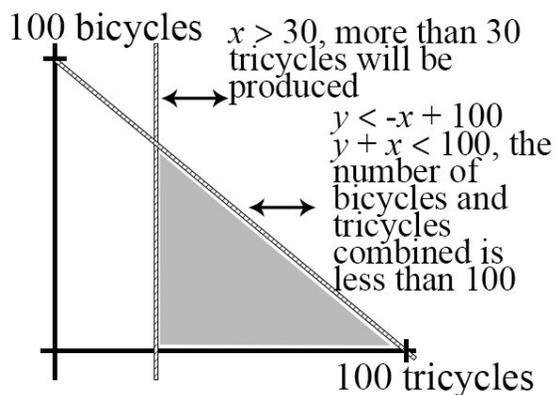
56. Answer: K. M400 Trigonometry



$$H = \sqrt{37^2 + 45^2}$$

K. $\cos \theta = \frac{45}{\sqrt{37^2 + 45^2}}$

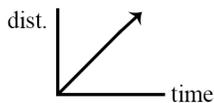
57. Answer: E. M210 Systems of Equations



E. The number of tricycles and bicycles together is less than 100, and the number of tricycles exceeds 30.

58. Answer: K. M207 Linear Functions: $y=mx+b$; M208 Coordinate Geometry & XY-plane

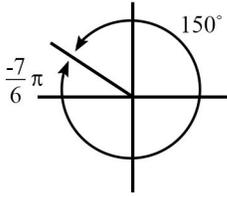
- I. Moving in a circle keeps the same distance, radius, from one point over time.
- II. Moving in a straight line away is a linear function with a positive slope.



III. Standing still is a horizontal line over time

K. I & III only

59. Answer: D. M400 Trigonometry



D. 150°

Tip: *Negative radians or degrees means the angle moves clockwise.*

60. Answer: G. M215 Equation of a Circle

$$(x - (-2))^2 + (y - 3)^2 = 5^2$$

$$(x + 2)^2 + (y - 3)^2 = 25$$

$$x^2 + 4x + 4 + y^2 - 6y + 9 = 25$$

combine constants and rewrite

G. $x^2 + y^2 + 4x - 6y = 12$

Reading Test

1. Answer: C. 104 Big Picture

Read the choices carefully, eliminating ones with incorrect details. Choice A can be eliminated because Sunday *left* after Nana's funeral. B and D can be eliminated because the two sisters have not yet tried to resolve their differences or argued with each other.

2. Answer: H. R301 Main Idea/Function: Paragraph

Choices F and G can be eliminated easily, because there is no evidence to support them in the passage. Between the two remaining answers, which are very similar, H is the better answer because the passage doesn't mention Delta and Sunday wanting control over each other.

3. Answer: A. R201 Detail; R203 Inference/Assumption

If you read carefully, you should remember there is only one mention of Sunday's thoughts on her home county. If not, skim the passage for any mention of Wake County, which occurs in lines 63-68. This section of the passage quotes Sunday's words from Delta's memory.

4. Answer: G. R302 Organization of the Passage

Skim the passage to find the point where the passage switches from Sunday's point of view to Delta's point of view. At line 30, Delta is introduced and the rest of the passage uses *she* to refer to Delta, rather than Sunday.

5. Answer: C. R201 Detail

Since the first part of the passage is from Sunday's point of view, skim starting at line 30, where it switches to Delta's point of view. The only answer choice that is directly supported in the text is C, which is mentioned in lines 59-60.

6. Answer: F. R201 Detail; R401 Least/Not/Except

The question asks about the first paragraph, so skim ONLY the first paragraph. Each answer choice is mentioned, except for F.

7. Answer: D. R203 Inference/Assumption; R101 Line Number

This question is tricky because the answer is not easily found, but start by rereading the lines before and after the mentioned line (26). The paragraph that contains the two words is mainly about Sunday's journey to the town where she grew up. Although it is not explicitly mentioned in the paragraph, the two words mentioned in the question refer to Sunday's relationship to her hometown.

8. Answer: G. R201 Detail

Skim the passage to find mention of Sunday's paintings and block prints, which occurs starting in line 41. Delta describes the artwork, but then states that they said something about the habit of love, which can be interpreted to mean the artwork shows that Sunday's care for Delta.

9. Answer: B. R201 Detail

This question is fairly straightforward, but it is important to find the place in the text where Delta accuses Sunday, NOT where Sunday is accusing Delta. The answer is explicitly stated in lines 77-79.

10. Answer: F. R202 Vocabulary in Context; R203 Inference/Assumption

This question can be tricky. Look at the lines in the text, and note that Delta's *smallness* refers to *measuring her sister*, which can imply that she is judging her sister. The answer choice closest to *judgmental* is choice **F**.

11. Answer: B. R201 Detail

This question is tricky because the correct answer is vague, so the best way to answer correctly is to eliminate the wrong answer choices. The republican political theory is described in lines 45-56, and directly contradicts answer choices **A**, **C**, and **D**.

12. Answer: G. R201 Detail

The paragraph that contains line 54 explicitly mentions *knowledge of public affairs* and *concern* for the community. A *sense of civic engagement* can be inferred from mentions of civic action in the paragraph.

13. Answer: B. R204 Main Idea/Function: Paragraph

Go back to the paragraph in the question, which describes the different ways liberals and conservatives apply the idea of neutrality. Answer choice **B** is the only one that refers to the differences between the two groups.

14. Answer: J. R204 Main Idea/Function: Paragraph

This paragraph has been used for several questions already, so you might be able to answer the question without rereading it. If you reread it, you see that the paragraph explicitly states the importance of *deliberating with fellow citizens about the common good*, which is a central idea of republican theory.

15. Answer: A. R202 Vocabulary in Context; R101 Line Number

In the lines preceding the line mentioned, the text mentions that citizens should possess certain civic virtues, and the republican theory supports action taken to cultivate these qualities. Choices **B**, **C**, and **D** can be eliminated because they are the opposite of the correct answer.

16. Answer: H. R204 Main Idea/Function: Paragraph; R102 Paragraph Number

By rereading the last paragraph, it is clear that the only new piece of information, that was not mentioned previously, is the authors complain about the current political philosophy. The last sentence specifically mentions the weakness of the current *public philosophy*.

17. Answer: A. R202 Vocabulary in Context

Always go back and check the context for these types of questions. Here, *political experience* refers to the history of our country, during which time ideas have been changing over time.

18. Answer: F. R201 Detail; R101 Line Number

Start by rereading the lines mentioned. The text explicitly states that neutrality is important to both liberals and conservatives. Although answer choice **F** is long and winding, it is clearly correct. Make sure to read the answer choices completely and carefully, since only the first half of **F** appears wrong.

19. Answer: D. R202 Vocabulary in Context

Begin by finding mention of *procedural republic* in the last paragraph. It is described as favoring the ability to choose one's own values rather than *cultivating virtue*. Using the terminology from earlier in the passage, we would describe this as *neutral*.

20. Answer: G. R201 Detail

If you read carefully, you should be able to answer this question from memory. If not, skim the passage for mentions of liberal ideas. The answer is explicitly found in the last two sentences of the passage (lines 74-end).

21. Answer: B. R104 Big Picture

This question can be answered by reading each of the choices carefully. Each of the incorrect answer choices has one part of it that is definitely wrong. Choice **A** can be eliminated because he didn't have difficulty understanding his grandfather, Choice **C** can be eliminated because he says he will keep gardening, and Choice **D** can be eliminated because he doesn't mention unpleasant memories.

22. Answer: J. R302 Inference/Assumption

It's important to note that the question is asking about perspective. The first part of the passage is told as memories from the narrator's childhood. Starting at line 74, the perspective changes from the narrator in current day.

23. Answer: D. R203 Inference/Assumption; R401 Least/Not/Except

Although the question asks for an inference, the text pretty clearly refers to each of the answer choices except **D**. Choice **D** is the correct answer because the narrator never mentions needing protection from other people.

24. Answer: H. R203 Inference/Assumption; R102 Paragraph Number

For questions like this, make sure to reread the lines mentioned and nothing else. In these paragraphs, it can be inferred from *I'd watched really carefully, so I knew what to do* that the narrator was trying to pay attention to detail and do a good job.

25. Answer: A. R204 Main Idea/Function: Paragraph

For questions like this, make sure to reread the lines mentioned and nothing else. It is easiest to answer by eliminating the other answer choices, which are clearly incorrect. Choice **B** can be eliminated because there is no mention of either one loving birds. Choice **C** can be eliminated because there was no discussion of the hoe after the initial mention. Choice **D** can be eliminated because the paragraphs are about the narrator's appreciation of the past, not his grandfather's.

26. Answer: G. R203 Inference/Assumption; R201 Detail

Although the answer is not explicitly stated, it can be reasonably inferred from these lines that the narrator respected and felt protected by his grandfather, who *seemed taller than the biggest trees, but wouldn't let me fall*.

27. Answer: A. R203 Inference/Assumption; R101 Line Number

The phrase *with a twinkle in his eye* clearly implies amusement. Even without recognizing that phrase, it can be inferred from the passage that the nickname is positive, but not quite to the extent of *elation*.

28. Answer: J. R201 Detail

Skim the text to find mention of Jess's Shadow, which is in lines 10-20. The answer is explicitly stated in lines 17-20.

29. Answer: C. R201 Detail

Skim the text to find mention of *fitting the ground to plant*, which is described in lines 48-56. The answer is explicitly stated in lines 50-55.

30. Answer: J. R203 Inference/Assumption

Although the author does not explicitly state the answer, it can be inferred from the author's use of the words *he did it with the same care* and the comparison to gathering eggs into a basket, that he is referring to the grandfather's reverence towards the object.

31. Answer: B. R301 Main Idea/Function: Passage; R104 Least/Not/Except

This question can be tricky because the passage starts with a comparison between reptiles and birds, suggesting that the passage will be about the comparison between the two. However, it is clear throughout the passage that bird eggs are the primary focus.

32. Answer: J. R201 Detail; R401 Least/Not/Except

The correct answer is explicitly stated in the passage. In line 37, it is stated that the amount of calcium is 2 grams, not 15 grams.

33. Answer: C. R204 Main Idea/Function: Paragraph

This question is pretty straightforward if you reread the last paragraph. The paragraph clearly discusses the variety of shapes of bird eggs.

34. Answer: J. R201 Detail

Skim the passage to find mention of turning eggs. The only mention is in the paragraph that is lines 24-32, but there is no explanation, only a description of a mechanism bird eggs have to allow them to turn.

35. Answer: A. R201 Detail

Skim the passage to find the lines that describe the overall structure. Lines 14-18 describe an egg that contains, from inside to outside, a yolk, albumen, two membranes, and shell.

36. Answer: H. R202 Vocabulary in Context

Reread the lines before and after the word *plumping*. Plumping takes eggs from loose-fitting membranes to taut membranes by adding water and salts to the albumen.

37. Answer: B. R202 Vocabulary in Context

Skim the passage to find mention of *chalazae*. The answer is stated explicitly in lines 26-29.

38. Answer: H. R202 Vocabulary in Context

Skim the passage to find mention of *protein fibers*. The answer is stated explicitly in lines 36-37.

39. Answer: D. R202 Vocabulary in Context

Skim the passage to find mention of *medullary bone*. The answer is stated explicitly in lines 42-46.

40. Answer: G. R201 Detail

Skim the passage to find mention of waders' eggs. The answer is stated explicitly in lines 83-86.

Science Test

1. Answer: B. S105 Text: Infer

The last paragraph of the text states that heat absorbed on the sun-facing side would have been lost from the side facing away, implying there is no heat kept by the body, and thus no change in body temperature.

2. Answer: H. S105 Text: Infer; S200 Science Knowledge

The statements of Scientist 1 suggest that the *Dimetrodons* used the sail to regulate body temperature and that it could warm itself up by exposing the sail to the sun. It can be inferred that exposing the sail to cold air (such as wind that is colder than body temperature) would cause the *Dimetrodons* to cool off by removing heat. The loss of heat is what results in *cooling off*.

3. Answer: C. S100 Text

Scientist 2 states that the *Dimetrodon* controlled its appearance by regulating blood supply, which could affect color or pattern.

4. Answer: F. S106 Text: Agree/Disagree

Scientist 1 states that elephants regulate temperature similarly to the *Dimetrodon* and Scientist 2 states that modern lizards change appearance like the *Dimetrodon*. Both scientists would agree that the *Dimetrodon* are similar to some modern animals.

5. Answer: A. S105 Text: Infer

Scientist 1 states that a reptile with a sail would reach the activity temperature faster than a reptile without a sail, so the inverse is also true: a reptile without a sail would reach the activity temperature more slowly than a reptile with a sail.

6. Answer: H. S106 Text: Agree/Disagree

Neither scientist mentions raising, lowering (F), shedding, and regrowing (G) sails. Scientist 1 would disagree that *Dimetrodons* could control body temperature without the sail (J), so only answer choice H remains. Both scientists mention the *Dimetrodon* controlling the blood supply to their sails, although for different purposes.

7. Answer: B. S105 Text: Infer; S108 Text to Data

Scientist 1 states that the *Dimetrodon* turned the broad side of its sail towards the sun to warm its body. Thus, it can be inferred that the *Dimetrodon* could cool its body by turning the broad side away from the sun, which would mean that the sail is roughly perpendicular to the sun. Choice B represents this.

8. Answer: G. S304 Table: Increase/Decrease

In Table 1, which describes the results of Experiment 1, the reaction time (last column) decreases as the temperature (middle column) increases.

9. Answer: D. S305 Table: Extrapolate

In Table 2, which describes the results of Experiment 2, the reaction time (last column) decreases as temperature (middle column) increases. The lowest reaction time is 12 seconds, at the highest temperature of 55°C. A lower reaction time, such as 6 seconds, would most likely occur at a higher temperature, above 55°C.

10. Answer: F. S101 Text: Experimental Design

The paragraph describing Experiment 2 explicitly states that the experiment was the same as Experiment 1, except that Experiment 2 included MnSO_4 .

11. Answer: B. S101 Text: Experimental Design

Experiment 2 involved adding a catalyst (**A**). Experiments 1 and 2 involved changing temperature (**C**). Experiment 3 involved changing concentration (**D**). The only remaining choice is **B**, since the reaction solvent or reactants were not changed at all.

12. Answer: H. S306 Table: Infer

Experiment 1 is described in Table 1. If the solutions were at 45°C and 40°C, the reaction time would likely fall between the reaction time at 35°C and 45°C, since a combination of liquids at 45°C and 40°C would result in a temperature between those. Thus, the reaction time would be between 48 seconds and 105 seconds.

13. Answer: D. S101 Text: Experimental Design; S200 Science Knowledge

Mixing the solution with H_2O , which is water, would dilute the solution and lower its concentration. Table 3 shows that as concentration increases, reaction time decreases. Since Trial 9 (on Table 3) is already the lowest concentration, repeating Trial 9 with an even lower concentration would result in a reaction time that was even higher than 837 seconds.

14. Answer: J. S300 Data

Figure 2 shows that as surface area increases, volume increases. If ova with larger volumes have more nutrients, the ova with the most nutrients would have the largest volume, and therefore the largest surface area. Since ostrich is not an answer choice, the next largest is hen.

15. Answer: A. S304 Table: Increase/Decrease

In Table 1, edge length (first column) increases as S/V (fourth column) decreases. The greatest S/V would have the smallest edge length of all the choices, which is 20 mm.

16. Answer: J. S301 Table; S201 Science Math

According to Table 1, the units for volume (third column) are mm^3 and the units for surface area (second column) are mm^2 . It is not necessary to understand how to calculate a ratio or be familiar with scientific notation.

17. Answer: B. S309 Bar Chart

According to Figure 1, a sphere (black bars) with a diameter of 6 mm would fall in between the S/V values for diameters of 4 mm and 8 mm, which are around 1.3 and 0.8 mm^{-1} . The only answer choice that falls between those two values is **B**, 1 mm^{-1} .

18. Answer: H. S305 Table: Extrapolate

According to Table 1, as edge length (first column) is divided by two, S/V (fourth column) doubles. Thus, if we divide an edge length of 1 mm by 2, the S/V of 6 mm^{-1} would double, resulting in an S/V of 12 mm^{-1} .

19. Answer: D. S317 XY Graph: Extrapolate

In Experiment 2, which is described by Figure 1, the boiling point at 60% is around 112°C and at 100% is around 198°C . The boiling point at 80% would likely be about halfway between those two numbers, which is above 115°C .

20. Answer: J. S302 Table: Data Point

Table 1 describes the freezing point at different masses. The first freezing point below -31°C is at 50 g of $\text{C}_2\text{H}_6\text{O}_2$ and 50 g of H_2O , which is 50% $\text{C}_2\text{H}_6\text{O}_2$.

21. Answer: D. S201 Text: Experimental Design; S200 Text

According to the formula in Experiment 1, mass is greatest when density is greatest. The text describing Experiment 1 states that as concentration of $\text{C}_2\text{H}_6\text{O}_2$ increased, density increased, and therefore mass also increased. Thus, the mass of the solution would be greatest at the greatest concentration of $\text{C}_2\text{H}_6\text{O}_2$, which is 40% in choice D.

22. Answer: G. S105 Text: Infer

In Experiment 3, Table 1 shows that as the mass of $\text{C}_2\text{H}_6\text{O}_2$ increased, the freezing point decreased. A mixture with 65% $\text{C}_2\text{H}_6\text{O}_2$ would have a lower freezing point than any of those listed in Table 1, so it is likely that the low-temperature bath was not cold enough (temperature was too high) to freeze the liquid.

23. Answer: A. S316 XY Graph: Increase/Decrease

According to Figure 1, which describes the results of Experiment 2, as the percent $\text{C}_2\text{H}_6\text{O}_2$ increases, boiling point increases, compared to a mixture that is only H_2O (has 0% $\text{C}_2\text{H}_6\text{O}_2$). The 0% mixture has a boiling point of 100°C and any mixture that contains $\text{C}_2\text{H}_6\text{O}_2$ has a higher boiling point.

24. Answer: G. S105 Text: Infer

The passage states that when a substance is dissolved in water, it raises the boiling point. Thus, the lowest boiling point would have nothing dissolved in it, which describes distilled water.

25. Answer: B. S101 Text: Experimental Design; S200 Science Knowledge

The experiment tested the rate of heat conduction when different lengths and diameters of wire were used. To test the effect of wire material, the experiment would have to be done with different materials that have the same size as each other, so material is the only variable and wire size is constant.

26. Answer: H. S302 Table: Data Point; S100 Text

The text states that thermal equilibrium is when the two objects are the same temperature. This only happens in Experiment 2, described in Table 2, when the 10 cm wire with a 1.4 mm diameter is used. The two blocks reach equilibrium at 40°C .

27. Answer: C. S307 Table to XY Graph; S304 Table: Increase/Decrease

In the second column of Table 1, the temperature of Block A after 1 minute increases as wire length increases. The only graph that shows both values increasing at the same time is C.

28. Answer: F. S105 Text: Infer

The text describes heat conduction as the transfer of heat from a higher temperature (in this experiment, Block A) to lower temperature (Block B). Brass has a lower thermal conductivity, so would not transfer heat as quickly. As a result, Block A would stay hotter (lose heat more slowly) and Block B would stay cooler (gain heat more slowly).

29. Answer: A. S200 Science Knowledge

Unless the wire conducting heat, as well as both blocks, were perfectly insulated, heat is likely to be lost to the air.

30. Answer: G. S305 Table: Extrapolate

If after 4 minutes, the temperature of Block A was 64°C, then the temperature would have to be higher than that after only 3 minutes, which could be the 20 cm, 1 mm wire (Table 1); 30 cm, 1 mm wire (Table 1); or the 30 cm, 1.4 mm wire (Table 2). If Block B is 23°C after 4 minutes, then Block B must be less than 23°C at 3 minutes, which could be 20 cm, 1 mm wire (Table 1); 30 cm, 1 mm wire (Table 1); or 30 cm, 1.4 mm (Table 2) wire. The only one of these choices that is an answer choice is 1 mm, 20 cm.

31. Answer: C. S100 Text

According to the first paragraph of the text, clouds form when air is cooled to the dew point. For clouds to be absent, the temperature would have to be above the dew point.

32. Answer: H. S200 Science Knowledge; S105 Text: Infer

The scientists are measuring how long it takes light to travel a certain distance. Since the speed of light is known, this can be used to calculate distance.

33. Answer: B. S105 Text: Infer; S317 XY Graph: Extrapolate

If clouds occur from 3,000 m to 4,000 m, there are clouds at 3,600, which implies the temperature has cooled to the dew point. In the graphs shown, both temperature and dew point decrease with altitude. Extrapolating from Figure 3, temperature would have to be less than 43°C and the dew point would have to be less than 43°C, but temperature would have to be at or lower than the dew point. Choice B is the only possible answer.

34. Answer: J. S318 XY Graph: Infer

In the graphs, the cloud base is lower when the average air temperature and average dew point are closer, such as in City D. Miami would have the lower cloud base because the average air temperature and average dew point are closer together (the difference between them is smaller).

35. Answer: A. S105 Text: Infer

The text states that clouds form when air temperature cools to the dew point. If the air temperature and the dew point are both the same at 0 m altitude, then there are clouds present at 0 m altitude.

36. Answer: G. S318 XY Graph: Infer

In Figure 1, the greatest change in percent saturation (y-axis) occurs when the line jumps up the most quickly, or has the steepest slope, which is between around 20 and 40 mmHg. **G** is the only answer choice that falls within this range.

37. Answer: A. S302 Table: Data Point

At 40 mmHg, which can be found along the x-axis of Figures 2 and 3, we find the highest saturation of O₂. Therefore the greatest amount of O₂ in Figure 2 is at a pH of 7.6 and in Figure 3 at 10°C.

38. Answer: J. S316 XY Graph: Increase/Decrease; S107 Text: Explain

In Figure 3, the line showing the greatest O₂ saturation is at 10°C and the least O₂ saturation is 43°C, showing that as temperature increases, O₂ saturation decreased.

39. Answer: D. S101 Text: Experimental Design; S200 Science Knowledge

When an experiment measures the effects of a variable, the other variable(s) should be held constant. In Figure 1, nothing is changed, so both pH and temperature are constant. In Figure 2, pH is changed, so temperature is constant. In Figure 3, temperature is changed, so pH is constant.

40. Answer: F. S318 XY Graph: Infer; S200 Science Knowledge

When CO₂ dissolves in water (blood is mostly water), it forms carbonic acid, lowering the pH. It can be inferred from Figure 1 that since high P_{CO₂} causes a lower pH (more acidic), CO₂ forms an acid.