

Answers with Explanations for English Test 2014

Dragonfly

1. **B** Complete. A comma is needed after snake because “curving and bending” is a participial phrase, describing the trail, and a dependent clause with no subject; “curving and bending” doesn’t need a comma in between. (punctuation)
2. **J** Complete. This sentence could be written several different ways. “paved it with packed gravel” is a dependent clause with no subject. It can’t stand alone without either punctuation or a conjunction. (sentence structure, word choice)
3. **D** Consistent. “they” would be a pronoun referring to the county. But the sentence isn’t talking about the county enjoying the trail. So any answer with “they” is incorrect. (parts of speech)
4. **F** Complete. H is incorrect because the sentence needs some kind of punctuation; “not on a bike . . .” is a dependent clause. A “;” doesn’t work because of the same reason, dependent clause. A “,” after bike doesn’t work because “but on ‘Luigi’” is a dependent clause. (punctuation, sentence structure)
5. **B** Clear, Complete. We have to know who “Luigi” is in order to understand what she is riding. So A and C are incorrect because they have nothing to do with Luigi. (style, word choice)
6. **J** Concise. Remember concise is always better according to the ACT. G,H, and J could all work but ACT wants brevity. F is incorrect because adding nothing in front of “I” makes it a run-on sentence. (word choice)
7. **D** Look at the clue in the question “positive, friendly attitude.” D implies that the author sees the wheelchair as more of a pet rather than a machine. A works grammatically. So does C. But they don’t give any personal feeling behind them. B is incorrect because a motor doesn’t “travel.” (style)
8. **F** Consistent. Notice the pronoun use throughout the essay. The preceding and next sentence both start with “I.” J makes the sentence incomplete with no subject. (parts of speech)
9. **A** Concise. C, and D are not necessarily incorrect, just wordy. B makes it so the sentence has no subject. (word choice)
10. **H** Clear, Sounds right. “gently along” is a phrase that shouldn’t have any punctuation in between it. A comma after “along” isn’t necessary with the flow of the sentence. “Gentle along” is an awkward phrase that isn’t used. (word choice, punctuation, sentence structure)
11. **A** This one is a tough one. There has been no mention of bikes until now. B and C don’t indicate something zooming past. “Days” might streak past but days can’t be “ridden.” (style, organization)
12. **H** Concise, Clear. F is wrong because there has to be some kind of punctuation. But the comma in J makes this a run-on sentence. Remember a comma can’t connect two independent clauses. It has to have a conjunction or you have to use a semicolon, colon, or period. G makes sense but also makes it wordy. (punctuation, sentence structure)
13. **D** Concise. B would have been correct if there wasn’t a comma after “looking” because the “and” connects the words. This sentence really doesn’t need punctuation. Keep things simple. (punctuation)
14. **G** Possessive noun so it needs an apostrophe so F is wrong. A noun that doesn’t end in “s” needs an ‘s. If a noun ends in “s” you would add an ‘ after the “s.” (usage)
15. **B** First figure out if the answer is “yes” or “no.” Yes, not only does this essay accomplish that goal, but the *reasons* behind the No answers are wrong. Remember, everything about the answer has to be right in order for it to be right. A is obviously wrong because there is only one mention of wildflowers in the whole essay.

Beneath the Streets of New York

16. **G** Complete. In glancing at the answers, you know this question is testing where to put the commas. Here's some strategies: Find the subject. "New York City residents" might seem like the subject but it is actually another prepositional phrase because of the "at." "thousands" is the subject. At the beginning of the sentence, "at" is a preposition beginning a prepositional phrase, which must end with a comma (not a semicolon because it's not a complete sentence), so immediately find any answers that have a comma after "1904." G and J do but J adds a comma after "thousands" which is unnecessary. Commas have to be in pairs to separate a phrase unless they are at the beginning or end of a sentence. (punctuation, sentence structure)
17. **C** "the completion . . . Subway" is an incomplete sentence. A semicolon has to separate complete sentences. A colon is used to list something, explain something, or expand on something. B sound off although it is punctuated right. (punctuation, word choice)
18. **G** Complete. Take out the phrase "the first section of" and the sentence becomes incorrect. They were not celebrating the completion of the entire New York Subway. F is correct but G is more correct. There is no evidence in the passage thus far for H or J.
19. **D** Concise. "In under a half an hour," or any re-wording of it, is repetitive. (word choice, organization)
20. **F** The question gives you the clue, referring you to the first part of the sentence that talks about "traffic jams." Only F addresses a solution to that.
21. **B** Consistent. This one is tricky. What is "that" referring to? The proposals? Even if "that" was correct, it is a singular pronoun that is inconsistent with proposals. "Those" might seem correct. But the thing that resolved the challenges wasn't necessarily the proposals but the people working on the proposals. (word choice, organization)
22. **J** Complete. This one is also tricky. This sentence really *should* have commas around "William Barclay Parsons." None of the options have commas on both sides of it. So the best option is no comma at all. G is incorrect because it would need a dash on the other side, as well. (punctuation)
23. **C** "innovative" is the only adjective in all of the choices. A would only be correct if that whole phrase was in quotes. (parts of speech)
24. **F** Concise. Complete. F is the most concise choices of F, G, and H. J makes the sentence somewhat incomplete and we are left unsure what the digging is doing. (organization, style)
25. **C** No punctuation is needed. B would only be correct if the preposition "with" was beginning a prepositional phrase. D is incorrect because a colon is not used after a preposition.
26. **G** Consistent. Here's your who/whom question! Remember: "who" is a subject; "whom" is an object, like an object of a preposition. Who begins a sentence; "whom" usually ends one. J is incorrect because deleting the phrase makes the second part of the sentence a complete sentence that cannot be separated by a comma. (usage)
27. **A** This refers back to the previous sentence. Many weren't sure about the subway, *however* they didn't take long to adapt. None of the other choices convey that contrast. (word choice)
28. **G** The clue is in the question: "describe the magnitude and expansiveness of the subway." F is a weak attempt. H doesn't give details about the number of people, only the size. J is completely irrelevant.
29. **C** This question specifically is referring to the tunnel digging technique. Where, in the essay, did it talk about that? A and B are too early. D is way out of context.

30. **J** Consistent. The clue is in the question. The best word choice to correspond with “decline” is “revived.” F isn’t incorrect, neither is H. They are just not the BEST word choice.
31. **B** A, C, and D imply his work catered to the upper class, when in reality it was bringing it “to the public.” (word choice, organization)
32. **J** Clear. Sounds right. F doesn’t sound right so you know it needs to be re-worded. Which one re-words it the best? G is worded weird. H would have worked, though a little wordy, if there were commas around “for his controversy.”
33. **D** Concise. “In his art” is redundant to “artistic subject.” The other choices are also wordy.
34. **H** Consistent. The word “as” is before “expansive” and naturally goes after it, as well. “Than” is the correct use here if the word before “expansive” was something like “more.” “then” is completely incorrect. *Then* tells progression, like what happens next. (word choice)
35. **B** Consistent. This pronoun is referring to “frescoes,” which is plural. None of the other choices are plural pronouns. (usage/parts of speech)
36. **H** Complete. F and G are incorrect because a period or a semicolon makes that an incomplete sentence. A dash cuts the sentence up abruptly. (punctuation)
37. **C** Consistent. Verb tense is being tested. Look at other verbs in this paragraph: moved, hunched, envisioned. “Was” is the only past tense, plus the others are wordy. Concise! (parts of speech)
38. **F** Concise. You might be tempted to put a comma in between “various” and “prestigious.” That would have been fine if there were no other commas inserted. All of the options include extra commas.
39. **C** This information hasn’t been mentioned before, and is not necessary for the sentence to be grammatically correct. (To test that, take the phrase out and see if the sentence is still correct.) And is anything but ambiguous. Sometimes finding what is *wrong* with each of the answers helps you find the one that is right.
40. **J** Two independent clauses can be joined with a comma AND a conjunction. “Since” and “when” are conjunctions but they do not convey the right meaning in the organization of the sentence. “Thus” is a conjunctive adverb that doesn’t work, either.
41. **B** Consistent. This question is testing verb tense consistency. “Depicts” would have been the most correct choice, if you were to look at other verbs in the paragraph: portrays, shows, celebrates. “Depict” is the next best option.
42. **F** Again, the “no” options to this question are not correct. So, the answer has to be one of the “yes” answers. G is completely incorrect, so the answer is F.
43. **B** Clear. Take out the prepositional phrase “by capturing . . . workers” to see what word best leads into “celebrates.” It becomes obvious which word sounds right. (word choice, organization)
44. **J** F, G, and H all indicate a contradiction. The last sentence adds to the meaning of the paragraph, it doesn’t contrast it. (word choice)

After All These Years

45. **A** Complete. The only other viable option in this sentence would be no punctuation at all. D makes the second part an incomplete sentence. “Yet” implies a contrast. (word choice)
46. **J** Clear. Without punctuation, it is a run-on sentence. You’re not being tested on which one is best, just which one is completely incorrect. (punctuation)
47. **C** Sounds right. A would be correct if there was a comma after “though.” The word “important” doesn’t sound right in either answer so B and D are out. (punctuation, word choice.)
48. **F** The question gives another clue. The “narrator’s positive reaction to speaking with Joan and the narrator’s fondness of her friend” are all valuable clues to the answer. Also there is a clue in the beginning of the sentence: “though we had rarely spoken to each other.” (style)

49. **B** Who is a subject. Which refers to anything other than a person. Whose is possessive.
50. **F** Refer back to the beginning of the sentence. "Through my parents" does not clump her with her parents but rather keeps her separate, which means you need a singular pronoun. The only other singular pronoun, "he" is completely incorrect. (parts of speech)
51. **B** Sentence 3 should be before sentence 2 because it explains why she would have been calling to see if they could meet up. Remember, you are trying to find the best answer. (organization)
52. **J** Concise. That phrase is really repeating information already given, so F and H are unnecessary. G is unnecessary information.
53. **D** Verb tense is being tested. "Shoned" is actually not a word. "Shone" and "shined" are the past tenses of "shine." (parts of speech)
54. **H** G seems like just as logical of an answer here. This one is a hard one. F is irrelevant. J is incorrect because the sentence adds to the story and seems necessary.
55. **A** Clear. Sounds right. The sentence gives a clue here with "familiar habits." It seems an awkward choice of words to say, "We *fell upon* (or *dropped by*, or *returned with*) our familiar habits." Sometimes you can insert the answer choices in and the right one will stand out. (word choice)
56. **H** Clear. This question is testing *location* with a list of prepositional phrases. Where they "would sit" should start with the most specific detail first and broaden from there. (parts of speech, sentence structure)
57. **B** Consistent. "absorbed," "engrossed," "immersed," and "engaged" are all synonyms for each other. "Acquired" means to obtain and doesn't fit here. (word choice)
58. **H** Consistent. Again, all of the words are synonyms of each other except for "along." (parts of speech, word choice)
59. **A** Look at the question for the clue: which one most "effectively summarizes the main idea"? B is too specific. C was irrelevant. D, although probably true and fitting the style of the essay, doesn't summarize the overall idea as well as A does. (style, organization)
60. **G** The logical place for this sentence is as a transition between her childhood memories and their lives as adults. This happens after paragraph 2.

Three Stars, Many Stories

61. **A** Concise. Clear. Complete. A is the most concise answer. B and C are actually not grammatically correct. B cuts the sentence short and incomplete. C includes an unnecessary comma and is wordy. Also, we don't attach something "because," we attach something "to." (sentence structure, punctuation)
62. **H** Either you need to put a period after sets and start a whole new sentence. Or you need a conjunction to join them. Without a conjunction, the sentence is a run-on sentence. J doesn't work because you would need a conjunction such as "as" to connect them. (sentence structure, punctuation)
63. **A** remember, commas come in pairs when adding detail with a clause or phrase that isn't necessary for the sentence. Lift out "or constellation" and the sentence still makes sense, which means it needs commas around it.
64. **H** This question requires you to read ahead. You could skip this question and come back to it when you are reading that paragraph. Choice H gives the most direct and detailed reference to Orion's story. The other choices are all correct, but which ones gives the "clearest allusion" or hint at his story? (style, organization, word choice)
65. **D** **Clear.** The clue here is in the question: "*visual* information." The only answer that creates some kind of picture you can envision in your mind is D.
66. **G** Find synonyms for "viewers." An overseer is a boss or supervisor. (word choice)

- 67. A** Clear. The most direct connection to a “three-pronged plow” is agricultural. (style, organization, word choice)
- 68. J** This answer is concise and fits the style of the author, who up to this point has not been personal or casual. F and G are too casual. H is too wordy. Shorter is better on the ACT when all answers are equally correct.
- 69. A** This question may seem exactly like the previous one and you might be tempted to answer D. However, concise is only better when all answers are equally correct. Using “this” loses the important transition that this sentence is actually talking about another example somewhere else in Japan. That same reasoning applies to the other answer choices; neither indicate a different example. (word choice)
- 70. G** Consistent. Verb tense/form question. Which one sounds right? Sometimes that helps. “Has” is the singular form. “Stars” is the subject. “Could of” implies a possibility instead of an absolute answer.
- 71. D** Concise. Even in punctuation, you can overdo it. Simplify. Only one comma is needed after the prepositional phrase starting with “in the mythology . . .” (punctuation)
- 72. J** H could be correct but is more wordy than J. F and G sound weird and imply the wrong meaning. (parts of speech)
- 73. C** *Classic ACT question.* You must know the difference between they’re, their, and there. It is tested in some way on almost every test. “They’re” is the contraction of “they are.” “their” is the possessive of “they.” “there” is a place, like “over there.” (parts of speech)
- 74. G** This sentence needs a semicolon if left as is; two independent clauses joined together. Otherwise you need a conjunction like and. H is incorrect because joining the clauses with “with” is fine, but you would have to change the verb “span” to “spanning.” J is incorrect because there is no pronoun referring back to stars. (punctuation)
- 75. D** The clue is in the question: “free of direct references to a specific cultures view of the three stars.” A, B, and C are all still referring to Greek or Western interpretation.

Reading Section Answers with Explanations 2014

Passage 1

Literary Narrative

“From Aboard the Night Train”

1. **D** This story is not really about riding a train, moving away from a hometown, or missing the new home she has established. A and B can also be considered incorrect because one can conclude from this story that the narrator is not a *young* adult. Too much time has past and too many changes have happened to assume this has only been a few years.
2. **H** Find the answers that do recur: dreams, reunion scenes, and train trips are recur. Photographs do not. That’s your answer.
3. **B** Although there is reference to Chicago, there is no definite indication she is from Chicago.
4. **G** She indicates that things have changed (so H is out), but not necessarily improved (so F is out). No mention is made of rebuilding, only reminiscing of what once was. So G is the most correct. Find reasons why the answers are wrong in order to find the right one.
5. **B** This one just requires you to remember details, or at least go back to categorize them. Find the answers that fit in the past; cross them out to find the one that fits in the present.
6. **F** Again, this question requires you to categorize which list the answers options came from.
7. **C** This requires inference, reading between the lines to see what the narrator really meant. Especially tie into the text in that paragraph: “coming back to find his whole world changed,” and “at least without a country he left behind” both indicate a symbolic rather than literal explanation.
8. **F** How can you know this? Use of the words “honey” and “beat your dad in cribbage” give it away. A neighbor doesn’t usually call someone “honey.” A sister would not refer to her dad as “your dad.”
9. **D** At the end of line 60, she uses a colon to show emphasis. All of those changes “paled in comparison” to that.
10. **H** This one can trick you! Look at the question: “news reports attributed” his knees buckling to what? Many will put G here because it is the right answer according to what the *narrator* thought. F and J are unsubstantiated.
11. **C** All of these answers are probably correct in some way. Which one best reflects what the question is asking for: an assumption most critical for the reader to agree with? Considering the passage is about trying to make this concept provide jobs and reduce/reuse waste, C best encompasses ALL of the passages purpose.

Passage II

Social Science

“Green Music in the Rain Forest”

12. **F** In the context of this paragraph, G and H aren’t applicable. J actually contradicts what the rest of the paragraph talks about, which is the movement to using other woods besides quickly depleting traditional woods.
13. **C** A and B imply negative feelings, which does not match the author’s tone. D implies something that was never mentioned in the essay, although it could be true.

14. **G** H could be correct, but G is more correct, and is the purpose of the essay. J has no reference anywhere else in the passage.
15. **D** Remember, these kinds of questions refer to this specific paragraph. Some of the answers may be correct for other paragraphs, but not this specific one. The “*main function*” of this paragraph is to show other woods could be used.
16. **H** This one is tricky. H is actually *partially* correct. But nowhere in the passage does it say they have become *extinct*. The other answers were all clearly indicated.
17. **B** Why is D not correct? Yes they may have political careers ahead of them, but that’s not the point. It’s that their political careers will be influenced by their environmental knowledge and experience in the forest. A and C might be true about the students, but not the reason they will impact the survival of the rain forests.
18. **J** Easy question because the answer is clearly stated. It’s just a matter of finding it. This is where mapping the questions is beneficial because you would have watched for that statistic when you read the passage.
19. **A** Again, an easy question if you mapped the questions as well as watched the *wording* in the question. B, C, and D were all clearly listed as “traditionally” used woods. A is the *substitute*.
20. **F** Another easy question if you mapped the question. The answer is clearly shown, even in italics, on lines 65-66.

Passage III

Humanities

“Finding Philosophy”

21. **C** Although all answers are correct in some way, C *best* describes his point of view.
22. **J** Again, it seems all of those answers are correct, at least at some point in his life. Butterflies are referred to in line 54, as something that he was interested in before age 10.
23. **A** B, C, and D are all incomplete and incorrect in some way. Remember, the answer has to be entirely correct in order to be correct.
24. **J** Clues to this are found around line 25. F and G refer to the wrong person. H refers to the wrong thought process.
25. **C** He never negatively refers to those years of fascination with music so any negative reference in any answer is incorrect. A and D have no supportive evidence in the passage.
26. **F** Look carefully at word choices in each answer. “Potent” and “powerful” are both initially right. “Delicate and inevitably wasted” and “gentle” are not implied at all. So you’ve narrowed it down to F or G. However, the second part of G is completely incorrect.
27. **C** This is an inference question that takes practice to answer accurately. Anytime a question refers to “context” you know that you have to do some reading between the lines and take in the passage tone and style as a whole to get the meaning.
28. **J** You could approach this question one of two ways. You can treat it like a vocabulary test, if you know what “rudimentary” means. (Something limited to its basic or simplest form.” However, there is also something going on in each one of the answers. F, G, and H are all partially correct. But each one has something incorrect in it as well. Pen and paper are not completely obsolete, G is an opinion, and H seems dramatic.
29. **A** All three of the words have to be right in order for the answer to be right. A has the most correct words, even though some of the other answers might have one or two correct words.
30. **F** Don’t let this one trick you. Which one does NOT work? F implies something being rare and becoming familiar.

Passage III

Natural Science

“Consider the Eel”

31. **B** Main idea again. All of the answers but one are correct in some way, they are just not the *main idea*. C is incorrect.
32. **H** J is a plausible answer, but H was more correct because it encompasses the idea that the adults have to travel back in order to reproduce.
33. **D** This paragraph mainly refers to what happens in the river. C is incorrect. Only one line refers to determining the age. A is a good candidate but doesn't really transition to the ocean.
34. **J** This question is simply finding the answer in the passage in line 13-14. You could have mapped this question and answered it easily.
35. **B** Another easy question because the answer is in the text. It follows the previous question and is found in line 14.
36. **G** This question is relying on some outside knowledge of the Bermuda Triangle. Legends about the Bermuda Triangle, in particular, are not necessarily well liked or most admired. There is no proof in the passage they are scientifically accepted.
37. **B** “Read” should almost be in quotation marks here. Just as a scientist may “read” the age of a tree from its rings, this statement is implying that the age of an eel can be “read” or “seen” by looking at the rings on the skull.
38. **F** The answers in this question all seem plausible because they are referenced somewhere else in the passage. The key is to find the specific place where the eels' pupils are mentioned. That is found in line 60.
39. **A** Again, all of the answers have been mentioned in the text. You must specifically find where it mentions osmosis. That is found in line 62.
40. **F** Line 82 refers to “such small larvae” as an indication it was newly hatched. This question can be answered by finding evidence in the text.



MATHEMATICS TEST

60 Minutes—60 Questions

DIRECTIONS: Solve each problem, choose the correct answer, and then fill in the corresponding oval on your answer document.

Do not linger over problems that take too much time. Solve as many as you can; then return to the others in the time you have left for this test.

You are permitted to use a calculator on this test. You may use your calculator for any problems you choose,

but some of the problems may best be done without using a calculator.

Note: Unless otherwise stated, all of the following should be assumed.

1. Illustrative figures are NOT necessarily drawn to scale.
2. Geometric figures lie in a plane.
3. The word *line* indicates a straight line.
4. The word *average* indicates arithmetic mean.

1. The weekly fee for staying at the Pleasant Lake Campground is \$20 per vehicle and \$10 per person. Last year, weekly fees were paid for v vehicles and p persons. Which of the following expressions gives the total amount, in dollars, collected for weekly fees last year?

- A. $20v + 10p$
- B. $20p + 10v$
- C. $10(v + p)$
- D. $30(v + p)$
- E. $10(v + p) + 20p$

Because there were v vehicles and each has a \$20 fee and p persons each with a \$10 fee, this is represented as $20v + 10p$

2. If $r = 9$, $b = 5$, and $g = -6$, what does $(r + b - g)(b + g)$ equal?

- E. -20
- G. -8
- H. 8
- J. 19
- K. 20

plug in the values to the equation:
 $(9 + 5 - (-6))(5 + (-6))$
 $= (9 + 5 + 6)(5 - 6)$
 $= (20)(-1) = -20$

3. A copy machine makes 60 copies per minute. A second copy machine makes 80 copies per minute. The second machine starts making copies 2 minutes after the first machine starts. Both machines stop making copies 8 minutes after the first machine started. Together, the 2 machines made how many copies?

- A. 480
- B. 600
- C. 680
- D. 720
- E. 960

First machine: $60 \text{ copies} \times 8 \text{ min} = 480 \text{ copies}$
 Second machine: $80 \text{ copies} \times 6 \text{ min} = 480 \text{ copies}$
 Added together: 960 total copies

4. Marlon is bowling in a tournament and has the highest average after 5 games, with scores of 210, 225, 254, 231, and 280. In order to maintain this exact average, what *must* be Marlon's score for his 6th game?

- F. 200
- G. 210
- H. 231
- J. 240
- K. 245

5 game average: $\frac{210 + 225 + 254 + 231 + 280}{5} = 240$
 To keep this exact average set up an equation:

ACT-57C-PRACTICE

$$\frac{210 + 225 + 254 + 231 + 280 + x}{6} = 240$$

Simplify: $\frac{1200 + x}{6} = 240$ then $(200 + x) = (240)6$
 Now solve for x :
 $x = (240)6 - 1200 = 1740$

5. Joelle earns her regular pay of \$7.50 per hour for up to 40 hours of work in a week. For each hour over 40 hours of work in a week, Joelle is paid $1\frac{1}{2}$ times her regular pay. How much does Joelle earn for a week in which she works 42 hours?

- A. \$126.00
- B. \$315.00
- C. \$322.50
- D. \$378.00
- E. \$472.50

$\$7.50 \times 40 = \300 for 40 hours
 She worked 2 hours over 40.
 For every hour over 40, she gets paid $\$7.50 + (\$7.50) = \$7.50 + \$3.75 = \$11.25$
 Multiply this by 2 so $\$11.25 \times 2 = \22.50
 And add to \$300 so $\$300 + \$22.50 = \$322.50$

6. Which of the following mathematical expressions is equivalent to the verbal expression "A number, x , squared is 39 more than the product of 10 and x "?

- F. $2x = 39 + 10x$
- G. $2x = 39x + 10x$
- H. $x^2 = 39 - 10x$
- J. $x^2 = 39 + x^{10}$
- K. $x^2 = 39 + 10x$

A number, x , squared = x^2
 39 more = $+39$
 Product of 10 and $x = 10x$
 $50 \dots$
 $x^2 = 39 + 10x$

7. If $9(x - 9) = -11$, then $x = ?$

- A. $-\frac{92}{9}$
- B. $-\frac{20}{9}$
- C. $-\frac{11}{9}$
- D. $-\frac{9}{2}$
- E. $\frac{70}{9}$

First multiply by 9.
 $9(x - 9) = 4x - 81$ so
 $4x - 81 = -11$ (add 81 to both sides)
 $4x = 70$ (divide by 4 on both sides)
 $\frac{4x}{4} = \frac{70}{4}$
 Then, $x = \frac{70}{4}$

GO ON TO THE NEXT PAGE.



8. Discount tickets to a basketball tournament sell for \$4.00 each. Enrico spent \$60.00 on discount tickets, \$37.50 less than if he had bought the tickets at the regular price. What was the regular ticket price?

F. \$ 2.50 How many tickets did he buy?
 G. \$ 6.40 \$60 tickets = 15 total tickets
 H. \$ 6.50 \$4 each
 J. \$ 7.50 what was regular price?
 K. \$11.00 \$60 + \$37.50 = \$97.50
 now divide by 15 tickets so $\frac{97.50}{15} = 6.50$

9. The expression $(3x - 4y^2)(3x + 4y^2)$ is equivalent to:

A. $9x^2 - 16y^4$ FOIL
 B. $9x^2 - 8y^4$ (first, outside, inside, last)
 C. $9x^2 + 16y^4$
 D. $6x^2 - 16y^4$
 E. $6x^2 - 8y^4$

$9x^2 + 12xy^2 - 12xy^2 - 16y^4 = 9x^2 - 16y^4$

10. A rectangle has an area of 32 square feet and a perimeter of 24 feet. What is the shortest of the side lengths, in feet, of the rectangle?

F. 1
 G. 2
 H. 3
 J. 4
 K. 8

$32 = _ \times _$
 $32 = 8 \times 4$ so...
 and
 $8 + 4 + 8 + 4 = 24$ so shortest side = 4

11. In $\triangle ABC$, the sum of the measures of $\angle A$ and $\angle B$ is 47° . What is the measure of $\angle C$?

A. 47°
 B. 86°
 C. 94°
 D. 133°
 E. 143°

sum of angles of a \triangle is always 180°
 so $180^\circ - 47^\circ = 133^\circ = \angle C$

12. In the school cafeteria, students choose their lunch from 3 sandwiches, 3 soups, 4 salads, and 2 drinks. How many different lunches are possible for a student who chooses exactly 1 sandwich, 1 soup, 1 salad, and 1 drink?

F. 2
 G. 4
 H. 12
 J. 36
 K. 72

Multiply the number of options together.
 $3 \times 3 \times 4 \times 2 = 72$

13. For 2 consecutive integers, the result of adding the smaller integer and triple the larger integer is 79. What are the 2 integers?

A. 18, 19
 B. 19, 20
 C. 20, 21
 D. 26, 27
 E. 39, 40

consecutive means next to each other in order.
 $_ + 3_ = 79$
 (try just plugging answers in)

14. A function $f(x)$ is defined as $f(x) = -8x^2$. What is $f(-3)$?

F. -72
 G. 72
 H. 192
 J. -576
 K. 576

Replace x with -3 so
 $f(-3) = -8(-3)^2$
 $= -8(9)$
 $= -72$

15. If $3^x = 54$, then which of the following must be true?

A. $1 < x < 2 \rightarrow 3-9$
 B. $2 < x < 3 \rightarrow 9-27$
 C. $3 < x < 4 \rightarrow 27-81$
 D. $4 < x < 5 \rightarrow 81-243$
 E. $5 < x \rightarrow 243-$

Plug in numbers for exponent x. In which range of numbers does 54 lie? 27-81 because 54 is between 27 and 81, thus $3 < x < 4$

16. What is the least common multiple of 70, 60, and 50?

F. 60 Not divisible by 70 or 50.
 G. 180 Not divisible by 70 or 50.
 H. 210 Not divisible by 60 or 50.
 J. 2,100 Divisible by all!!!
 K. 210,000

17. Hot Shot Electronics is designing a packing box for its new line of Acoustical Odyssey speakers. The box is a rectangular prism of length 45 centimeters, width 30 centimeters, and volume 81,000 cubic centimeters. What is the height, in centimeters, of the box?

A. 75
 B. 60
 C. 48
 D. 27
 E. 18

volume = length x width x height so...
 $81000 = 45(30)h$
 $\frac{81000}{1350} = \frac{1350h}{1350}$ so $h = 60$

18. Four points, A, B, C, and D, lie on a circle having a circumference of 15 units. B is 2 units counterclockwise from A. C is 5 units clockwise from A. D is 7 units clockwise from A and 8 units counterclockwise from A. What is the order of the points, starting with A and going clockwise around the circle?

F. A, B, C, D
 G. A, B, D, C
 H. A, C, B, D
 J. A, C, D, B
 K. A, D, C, B

A, C, D, B

19. A group of cells grows in number as described by the equation $y = 16(2)^t$, where t represents the number of days and y represents the number of cells. According to this formula, how many cells will be in the group at the end of the first 5 days?

A. 80
 B. 160
 C. 400
 D. 512
 E. 1,280

plug in $t = 5$
 $y = 16(2)^5 = 16(32) = 512$



20. The length of a rectangle is 3 times the length of a smaller rectangle. The 2 rectangles have the same width. The area of the smaller rectangle is A square units. The area of the larger rectangle is kA square units. Which of the following is the value of k ?

- E. $\frac{1}{9}$
- G. $\frac{1}{3}$
- H. 1
- J. 3**
- K. 9

If the rectangle's area is length times width then the larger rectangle will be 3 times the area of the smaller.

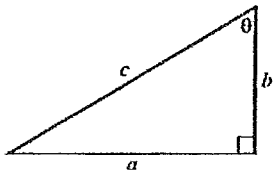
21. $(a + 2b + 3c) - (4a + 6b - 5c)$ is equivalent to:

- A. $-4a - 8b - 2c$
- B. $-4a - 4b + 8c$
- C. $-3a + 8b - 2c$
- D. $-3a - 4b - 2c$
- E. $-3a - 4b + 8c$**

$(4 + 2b + 3c) + (-4a - 6b + 5c)$
by distributing the negative.
Now join the like terms so
 $-3a - 4b + 8c$

22. The dimensions of the right triangle shown below are given in feet. What is $\sin \theta$?

- E. $\frac{a}{b}$
- G. $\frac{a}{c}$**
- H. $\frac{b}{c}$
- J. $\frac{b}{a}$
- K. $\frac{c}{a}$



$\sin \theta = \frac{\text{opposite side}}{\text{hypotenuse side}} = \frac{a}{c}$

23. In a basketball passing drill, 5 basketball players stand evenly spaced around a circle. The player with the ball (the passer) passes it to another player (the receiver). The receiver cannot be the player to the passer's immediate right or left and cannot be the player who last passed the ball. A designated player begins the drill as the first passer. This player will be the receiver for the first time on which pass of the ball?

- A. 4th
- B. 5th**
- C. 6th
- D. 10th
- E. 24th



player 1 will be the receiver on the fifth pass!

24. Lines p and n lie in the standard (x, y) coordinate plane. An equation for line p is $y = 0.12x + 3,000$. The slope of line n is 0.1 greater than the slope of line p . What is the slope of line n ?

- F. 0.012
- G. 0.02
- H. 0.22**
- J. 1.2
- K. 300

slope of line $p = 0.12$
slope of line $n = 0.12 + 0.1 = 0.22$

25. The expression $-8x^3(7x^6 - 3x^5)$ is equivalent to:

- A. $-56x^9 + 24x^8$**
- B. $-56x^9 - 24x^8$
- C. $-56x^{18} + 24x^{15}$
- D. $-56x^{18} - 24x^{15}$
- E. $-32x^4$

$-56x^9 + 24x^8$

Remember to distribute the negative and add the exponents!

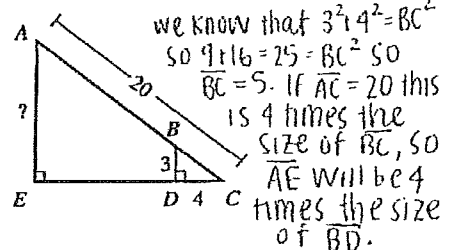
26. $-3|-6 + 8| = ?$

- E. -42
- G. -6**
- H. -1
- J. 6
- K. 42

Always compute inside absolute value first: $-3|2| = -6$

27. In right triangle $\triangle ACE$ below, \overline{BD} is parallel to \overline{AE} , and \overline{BD} is perpendicular to \overline{EC} at D . The length of \overline{AC} is 20 feet, the length of \overline{BD} is 3 feet, and the length of \overline{CD} is 4 feet. What is the length, in feet, of \overline{AE} ?

- A. 10
- B. 12**
- C. 15
- D. 16
- E. 17



28. As part of a lesson on motion, students observed a cart rolling at a constant rate along a straight line. As shown in the chart below, they recorded the distance, y feet, of the cart from a reference point at 1-second intervals from $t = 0$ seconds to $t = 5$ seconds.

t	0	1	2	3	4	5
y	14	19	24	29	34	39

Which of the following equations represents this data?

- F. $y = t + 14$
- G. $y = 5t + 9$
- H. $y = 5t + 14$**
- J. $y = 14t + 5$
- K. $y = 19t$

substitute t -values into equation and see which equation outputs the appropriate y -values.
 $5(0) + 14 = 14$ $5(2) + 14 = 24$ etc.
 $5(1) + 14 = 19$ $5(3) + 14 = 29$ etc.



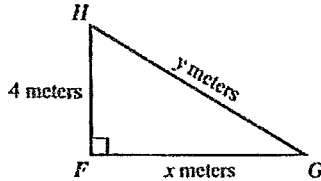
29. The inequality $6(x + 2) > 7(x - 5)$ is equivalent to which of the following inequalities?

- A. $x < -23$
 - B. $x < 7$
 - C. $x < 17$
 - D. $x < 37$
 - E. $x < 47$
- $6(x+2) > 7(x-5)$
 $6x+12 > 7x-35$ (distribute)
 $-6x \quad -6x$ (subtract $6x$)
 $12 > x-35$
 $+35 \quad +35$ (Add 35)
 $47 > x$

30. The sides of a square are 3 cm long. One vertex of the square is at $(2, 0)$ on a square coordinate grid marked in centimeter units. Which of the following points could also be a vertex of the square?

- F. $(-1, 0)$
 - G. $(0, 1)$
 - H. $(1, -1)$
 - I. $(4, 1)$
 - K. $(5, 0)$
-

31. For $\triangle FGH$, shown below, which of the following is an expression for y in terms of x ?

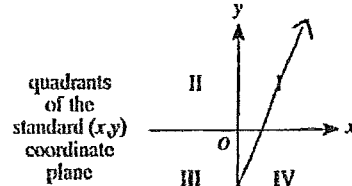


- A. $x + 4$
 - B. $\sqrt{x^2 + 4}$
 - C. $\sqrt{x^2 + 8}$
 - D. $\sqrt{x^2 - 16}$
 - E. $\sqrt{x^2 + 16}$
- $x^2 + 4^2 = y^2$
 This is Pythagorean's theorem.
 $y = \sqrt{x^2 + 4^2}$
 $y = \sqrt{x^2 + 16}$

32. A bag contains 12 red marbles, 5 yellow marbles, and 15 green marbles. How many additional red marbles must be added to the 32 marbles already in the bag so that the probability of randomly drawing a red marble is $\frac{3}{5}$?

- F. 13
 - G. 18
 - H. 28
 - J. 32
 - K. 40
- want: $\frac{3}{5}$ red marbles.
 have: $\frac{12}{32}$ red marbles.
 plug in some answers:
 $\frac{12+18}{32+18} = \frac{30}{50} = \frac{3}{5}$ so
 we want 18 more red marbles.

33. What are the quadrants of the standard (x, y) coordinate plane below that contain points on the graph of the equation $4x - 2y = 8$?



- A. I and III only
- B. I, II, and III only
- C. I, II, and IV only
- D. I, III, and IV only
- E. II, III, and IV only

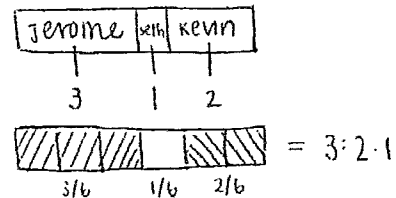
put equation into $y = mx + b$ form.
 $-2y = -4x + 8$
 $\frac{-2y}{-2} = \frac{-4x}{-2} + \frac{8}{-2}$
 $y = 2x - 4$

34. The graph of $y = -5x^2 + 9$ passes through $(1, 2a)$ in the standard (x, y) coordinate plane. What is the value of a ?

- F. 2
 - G. 4
 - H. 7
 - J. -1
 - K. -8
- plug in $x=1$ and solve for y .
 $y = -5(1)^2 + 9$
 $y = -5 + 9$
 $y = 4$ so if $2a = 4$ then $a = 2$.

35. Jerome, Kevin, and Seth shared a submarine sandwich. Jerome ate $\frac{1}{2}$ of the sandwich, Kevin ate $\frac{1}{3}$ of the sandwich, and Seth ate the rest. What is the ratio of Jerome's share to Kevin's share to Seth's share?

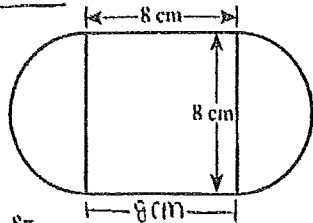
- A. 2:3:6
- B. 2:6:3
- C. 3:1:2
- D. 3:2:1
- E. 6:3:2



36. A particular circle in the standard (x, y) coordinate plane has an equation of $(x - 5)^2 + y^2 = 38$. What are the radius of the circle, in coordinate units, and the coordinates of the center of the circle?

- | | radius | center | Equation of a circle: |
|-------------------------------------|-------------|-----------|--|
| <input checked="" type="radio"/> F. | $\sqrt{38}$ | $(5, 0)$ | $(x-h)^2 + (y-k)^2 = r^2$ |
| G. | 19 | $(5, 0)$ | $r = \text{radius}$ |
| H. | 38 | $(5, 0)$ | $(h, k) = \text{center point}$ |
| J. | $\sqrt{38}$ | $(-5, 0)$ | so $r = \sqrt{38}$ and center = $(5, 0)$ |
| K. | 19 | $(-5, 0)$ | |

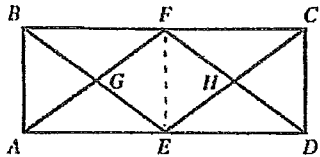
37. The figure below consists of a square and 2 semicircles, with dimensions as shown. What is the outside perimeter, in centimeters, of the figure?



- A. $8 + 8\pi$
 B. $16 + 8\pi$
 C. $16 + 16\pi$
 D. $32 + 8\pi$
 E. $32 + 16\pi$

circumference = $2\pi r = 2\pi(4)$
 $= 8\pi$
 $8\text{cm} + 8\text{cm} + 8\pi = \boxed{16 + 8\pi}$

38. In the figure below, points E and F are the midpoints of sides AD and BC of rectangle ABCD, point G is the intersection of AF and BE, and point H is the intersection of CE and DF. The interior of ABCD except for the interior of EGFH is shaded. What is the ratio of the area of EGFH to the area of the shaded region?



- F. 1:2
 G. 1:3
 H. 1:4
 J. 1:6

There are 3 triangles equivalent to EGFH that are shaded.

- K. Cannot be determined from the given information

39. The coordinates of the endpoints of \overline{CD} , in the standard (x,y) coordinate plane, are (-4,-2) and (14,2). What is the x-coordinate of the midpoint of \overline{CD} ?

- A. 0
 B. 2
 C. 5
 D. 9
 E. 10

Midpoint is the average of the two points:
 $\left(\frac{14+(-4)}{2}, \frac{2+(-2)}{2}\right) = \left(\frac{10}{2}, \frac{0}{2}\right) = (5, 0)$
 The x-coordinate = $\boxed{5}$

40. What is the surface area, in square inches, of an 8-inch cube?

- E. 512
 G. 384
 H. 320
 J. 256
 K. 192

$8 \times 8 = 64$
 so one side of the cube is equal to 64 in^2
 times this by 6 sides so
 $64 \times 6 = \boxed{384}$

41. The equations below are linear equations of a system where a, b, and c are positive integers.

$$ay + bx = c$$

$$ay - bx = c$$

Which of the following describes the graph of at least 1 such system of equations in the standard (x,y) coordinate plane?

- I. 2 parallel lines
 II. 2 intersecting lines
 III. A single line

- A. I only
 B. II only
 C. III only
 D. I or II only
 E. I, II, or III

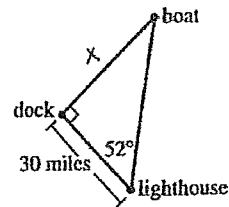
put lines in $y = mx + b$ form.
 $ay + bx = c \rightarrow y = -\frac{b}{a}x + \frac{c}{a}$

$ay - bx = c \rightarrow y = \frac{b}{a}x + \frac{c}{a}$

they will intersect because they have opposite slopes.

42. According to the measurements given in the figure below, which of the following expressions gives the distance, in miles, from the boat to the dock?

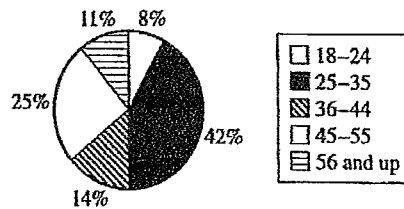
- F. $30 \tan 52^\circ$
 G. $30 \cos 52^\circ$
 H. $30 \sin 52^\circ$
 J. $\frac{30}{\cos 52^\circ}$
 K. $\frac{30}{\sin 52^\circ}$



x is opposite side of 52° . $\tan = \frac{\text{opposite}}{\text{adjacent}}$
 so $\tan 52 = \frac{x}{30} \rightarrow \boxed{30 \tan 52 = x}$

43. The circle graph below shows the distribution of registered voters, by age, for a community. Registered voters are randomly selected from this distribution to be called for jury duty. What are the odds (in the age range: not in the age range) that the first person called for jury duty is in the age range of 25-35 years?

Distribution of Registered Voters by Age



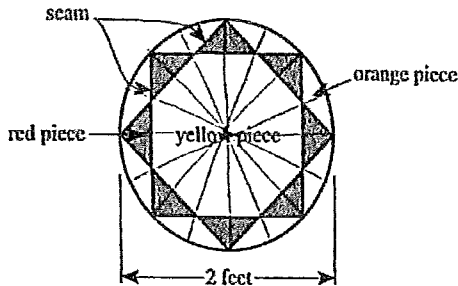
- A. 1:3
 B. 7:8
 C. 7:43
 D. 21:29
 E. 42:25

not in range: $14 + 25 + 11 + 8 = 58$
 so our ratio would be $42:58$ then simplified gets you $\boxed{21:29}$



Use the following information to answer questions 44–46.

The figure below shows the design of a circular stained-glass panel on display at Hopewell's Antique Shop. Seams separate the pieces of the panel. All red triangular pieces shown are congruent and have a common vertex with each adjoining triangular piece. The 2 squares shown are inscribed in the circle. The diameter of the panel is 2 feet.

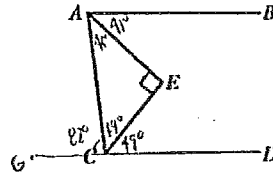


44. The design of the stained-glass panel has how many lines of symmetry in the plane of the panel?
- F. 2
 G. 4
 H. 8
 J. 16
 K. Infinitely many
- shown in picture above.*

45. What is the area of the stained-glass panel, to the nearest 0.1 square foot?
- A. 3.1
 B. 4.0
 C. 6.2
 D. 8.0
 E. 12.6
- Area of circle = πr^2
 $r = 1$
 $A = \pi(1)^2$
 $= \pi$
 $= 3.1$*

46. Kaya wants to install a new circular stained-glass window in her living room. The design of the window will be identical to that of the panel. The diameter of the new window will be 75% longer than the diameter of the panel. The new window will be how many feet in diameter?
- F. 1.50
 G. 2.50
 H. 2.75
 I. 3.50
 K. 4.00
- 2 feet originally
 want: 75% longer
 $2(1.75) = 3.5$*

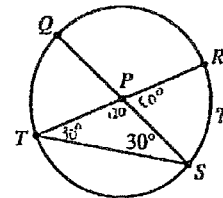
47. In the figure below, $\overline{AB} \parallel \overline{CD}$, \overline{AE} bisects $\angle BAC$, and \overline{CE} bisects $\angle ACD$. If the measure of $\angle BAC$ is 82° , what is the measure of $\angle AEC$?



- A. 86°
 B. 88°
 C. 90°
 D. 92°
 E. Cannot be determined from the given information

*$\angle BAC = 82^\circ = \angle ACG$
 $180^\circ - 82^\circ = 98^\circ = \angle ACD$
 $\frac{98^\circ}{2} = 49^\circ = \angle ACE$
 $\angle EAC + \angle ACE = 41^\circ + 49^\circ = 90^\circ$ and $180^\circ - 90^\circ = 90^\circ = \angle AEC$*

48. In the circle shown below, chords \overline{TR} and \overline{QS} intersect at P , which is the center of the circle, and the measure of $\angle PST$ is 30° . What is the degree measure of minor arc \overline{RS} ?



- F. 30°
 G. 45°
 H. 60°
 J. 90°
 K. Cannot be determined from the given information

$\triangle PTS$ is isosceles so the two base angles are equal. Angles of a $\triangle = 180^\circ$ total so $180^\circ - 30^\circ - 30^\circ = 120^\circ$. And TR is a straight line so $180^\circ - 120^\circ = 60^\circ$.

49. For what value of a would the following system of equations have an infinite number of solutions?

$2x - y = 8$
 $6x - 3y = 4a$

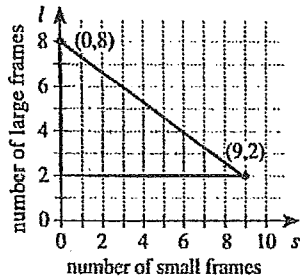
- A. 2
 B. 6
 C. 8
 D. 24
 E. 32
- $6x$ is 3 times $2x$. So the equation 2 is 3 times equation 1. So $8 \times 3 = 24$ set this equal to $4a$
 $\frac{24}{4} = \frac{4a}{4} \rightarrow a = 6$*

GO ON TO THE NEXT PAGE.



Use the following information to answer questions 50–52.

Marcia makes and sells handcrafted picture frames in 2 sizes: small and large. It takes her 2 hours to make a small frame and 3 hours to make a large frame. The shaded triangular region shown below is the graph of a system of inequalities representing weekly constraints Marcia has in making the frames. For making and selling s small frames and l large frames, Marcia makes a profit of $30s + 70l$ dollars. Marcia sells all the frames she makes.



50. The weekly constraint represented by the horizontal line segment containing $(9, 2)$ means that each week Marcia makes a minimum of:

- F. 2 large frames.
 - G. 9 large frames.
 - H. 2 small frames.
 - J. 9 small frames.
 - K. 11 small frames.
- since the line is $y=2$, we know that she makes a minimum of 2 large frames each week.

51. For every hour that Marcia spends making frames in the second week of December each year, she donates \$3 from that week's profit to a local charity. This year, Marcia made 4 large frames and 2 small frames in that week. Which of the following is closest to the percent of that week's profit Marcia donated to the charity?

- A. 6%
 - B. 12%
 - C. 14%
 - D. 16%
 - E. 19%
- use equation: $30s + 70l$
 plug in $s=2$ and $l=4$.
 $\$: 30(2) + 70(4) = 60 + 280 = \340
 time: $2(2) + 4(3) = 16$ hours
 $16 \text{ hrs.} \times \$3 = \48 and $\frac{48}{340} = 14\%$

52. What is the maximum profit Marcia can earn from the picture frames she makes in 1 week?

- F. \$410
 - G. \$460
 - H. \$540
 - J. \$560
 - K. \$690
- look at the graph. what is the maximum? 8 large frames.
 so $30(0) + 70(8) = \$560$

53. The determinant of a matrix $\begin{bmatrix} a & b \\ c & d \end{bmatrix}$ equals $ad - cb$.

What must be the value of x for the matrix $\begin{bmatrix} x & 8 \\ x & x \end{bmatrix}$ to have a determinant of -16 ?

- A. -4
 - B. -2
 - C. $-\frac{8}{5}$
 - D. $\frac{8}{3}$
 - E. 4
- determinant: $x^2 - 8x$
 set that equal to -16 so
 $x^2 - 8x = -16$
 $x^2 - 8x + 16 = 0$
 factor into $(x-4)(x-4) = 0$
 so $x=4$

54. A formula for finding the value, A dollars, of P dollars invested at $i\%$ interest compounded annually for n years is $A = P(1 + 0.01i)^n$. Which of the following is an expression for P in terms of i , n , and A ?

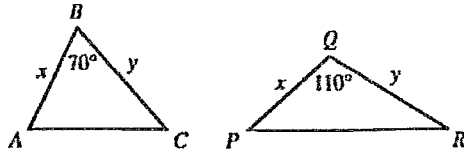
- F. $A - 0.01i^n$
 - G. $A + 0.01i^n$
 - H. $\left(\frac{A}{1 + 0.01i}\right)^n$
 - J. $\frac{A}{(1 + 0.01i)^n}$
 - K. $\frac{A}{(1 + 0.01i)^n}$
- $A = P(1 + 0.01i)^n$
 solve for P by dividing
 $(1 + 0.01i)^n$.
 $P = \frac{A}{(1 + 0.01i)^n}$

55. If x and y are real numbers such that $x > 1$ and $y < -1$, then which of the following inequalities must be true?

- A. $\frac{x}{y} > 1$ when $x=2$ and $y=-2$, $\frac{2}{-2} = -1 \not> 1$.
 - B. $|x|^2 > |y|$ when $x=2$ and $y=-5$, $|2|^2 = 4 \not> |-5| = 5$
 - C. $\frac{x}{3} - 5 > \frac{y}{3} - 5$
 - D. $x^2 + 1 > y^2 + 1$ when $x=2$ and $y=-2$ then $2^2 + 1 \not> (-2)^2 + 1$, they are equal.
 - E. $x^2 > y^2$ when $x=2$ and $y=-2$, then $(2)^2 \not> (-2)^2$ they are equal.
- GO ON TO THE NEXT PAGE.



56. Triangles $\triangle ABC$ and $\triangle PQR$ are shown below. The given side lengths are in centimeters. The area of $\triangle ABC$ is 30 square centimeters. What is the area of $\triangle PQR$, in square centimeters?

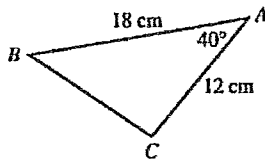


- F. 15
G. 19
H. 25
J. 30
K. 33

Area = $\frac{ab \sin C}{2}$
 $30 = \frac{xy \sin 70}{2}$ Area = $\frac{xy \sin 110}{2}$
 $xy \sin 70 = xy \sin 110$ so area = **30**

57. Triangle $\triangle ABC$ is shown in the figure below. The measure of $\angle A$ is 40° , $AB = 18$ cm, and $AC = 12$ cm. Which of the following is the length, in centimeters, of BC ?

(Note: For a triangle with sides of length a , b , and c opposite angles $\angle A$, $\angle B$, and $\angle C$, respectively, the law of sines states $\frac{\sin \angle A}{a} = \frac{\sin \angle B}{b} = \frac{\sin \angle C}{c}$ and the law of cosines states $c^2 = a^2 + b^2 - 2ab \cos \angle C$.)



- A. $12 \sin 40^\circ$
 B. $18 \sin 40^\circ$
 C. $\sqrt{18^2 - 12^2}$
 D. $\sqrt{12^2 + 18^2}$
 E. $\sqrt{12^2 + 18^2 - 2(12)(18) \cos 40^\circ}$

use Law of Cosines:
 $c^2 = 12^2 + 18^2 - 2(12)(18) \cos 40^\circ$
 $c = \sqrt{12^2 + 18^2 - 2(12)(18) \cos 40^\circ}$

58. What is the sum of the first 4 terms of the arithmetic sequence in which the 6th term is 8 and the 10th term is 13?

- F. 10.5
 G. 14.5
 H. 18
 J. 21.25
 K. 39.5

Terms:	1	2	3	4	5	6	7	8	9	10
values:	1.75	3	4.25	5.5	6.75	8	9.25	10.5	11.75	13
	1.75	1.25	1.25	1.25	1.25	1.25	1.25	1.25	1.25	1.25

$1.75 + 3 + 4.25 + 5.5 = 14.5$

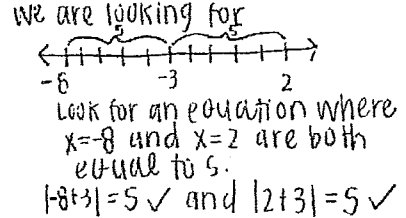
59. In the equation $x^2 + mx + n = 0$, m and n are integers. The only possible value for x is -3 . What is the value of m ?

- A. 3
 B. -3
 C. 6
 D. -6
 E. 9

If $x = -3$ then $(x+3)(x+3) = 0$ so use FOIL and $x^2 + 6x + 9 = 0$ so $m = 6$

60. The solution set of which of the following equations is the set of real numbers that are 5 units from -3 ?

- F. $|x+3| = 5$
 G. $|x-3| = 5$
 H. $|x+5| = 3$
 J. $|x-5| = 3$
 K. $|x+5| = 3$



END OF TEST 2

STOP! DO NOT TURN THE PAGE UNTIL TOLD TO DO SO.

DO NOT RETURN TO THE PREVIOUS TEST.

Answers with Explanations for English Test 2014

Dragonfly

1. **B** Complete. A comma is needed after snake because "curving and bending" is a participial phrase, describing the trail, and a dependent clause with no subject; "curving and bending" doesn't need a comma in between. (punctuation)
2. **J** Complete. This sentence could be written several different ways. "paved it with packed gravel" is a dependent clause with no subject. It can't stand alone without either punctuation or a conjunction. (sentence structure, word choice)
3. **D** Consistent. "they" would be a pronoun referring to the county. But the sentence isn't talking about the county enjoying the trail. So any answer with "they" is incorrect. (parts of speech)
4. **F** Complete. H is incorrect because the sentence needs some kind of punctuation; "not on a bike . . ." is a dependent clause. A ";" doesn't work because of the same reason, dependent clause. A ";" after bike doesn't work because "but on 'Luigi'" is a dependent clause. (punctuation, sentence structure)
5. **B** Clear, Complete. We have to know who "Luigi" is in order to understand what she is riding. So A and C are incorrect because they have nothing to do with Luigi. (style, word choice)
6. **J** Concise. Remember concise is always better according to the ACT. G, H, and J could all work but ACT wants brevity. F is incorrect because adding nothing in front of "I" makes it a run-on sentence. (word choice)
7. **D** Look at the clue in the question "positive, friendly attitude." D implies that the author sees the wheelchair as more of a pet rather than a machine. A works grammatically. So does C. But they don't give any personal feeling behind them. B is incorrect because a motor doesn't "travel." (style)
8. **F** Consistent. Notice the pronoun use throughout the essay. The proceeding and next sentence both start with "I." J makes the sentence incomplete with no subject. (parts of speech)
9. **A** Concise. C, and D are not necessarily incorrect, just wordy. B makes it so the sentence has no subject. (word choice)
10. **H** Clear, Sounds right. "gently along" is a phrase that shouldn't have any punctuation in between it. A comma after "along" isn't necessary with the flow of the sentence. "Gentle along" is an awkward phrase that isn't used. (word choice, punctuation, sentence structure)
11. **A** This one is a tough one. There has been no mention of bikes until now. B and C don't indicate something zooming past. "Days" might streak past but days can't be "ridden." (style, organization)
12. **H** Concise, Clear. F is wrong because there has to be some kind of punctuation. But the comma in J makes this a run-on sentence. Remember a comma can't connect two independent clauses. It has to have a conjunction or you have to use a semicolon, colon, or period. G makes sense but also makes it wordy. (punctuation, sentence structure)
13. **D** Concise. B would have been correct if there wasn't a comma after "looking" because the "and" connects the words. This sentence really doesn't need punctuation. Keep things simple. (punctuation)
14. **G** Possessive noun so it needs an apostrophe so F is wrong. A noun that doesn't end in "s" needs an 's. If a noun ends in "s" you would add an ' after the "s." (usage)
15. **B** First figure out if the answer is "yes" or "no." Yes, not only does this essay accomplish that goal, but the reasons behind the No answers are wrong. Remember, everything about the answer has to be right in order for it to be right. A is obviously wrong because there is only one mention of wildflowers in the whole essay.

Beneath the Streets of New York

16. **G** Complete. In glancing at the answers, you know this question is testing where to put the commas. Here's some strategies: Find the subject. "New York City residents" might seem like the subject but it is actually another prepositional phrase because of the "at." "thousands" is the subject. At the beginning of the sentence, "at" is a preposition beginning a prepositional phrase, which must end with a comma (not a semicolon because it's not a complete sentence), so immediately find any answers that have a comma after "1904." G and J do but J adds a comma after "thousands" which is unnecessary. Commas have to be in pairs to separate a phrase unless they are at the beginning or end of a sentence. (punctuation, sentence structure)
17. **C** "the completion . . . Subway" is an incomplete sentence. A semicolon has to separate complete sentences. A colon is used to list something, explain something, or expand on something. B sound off although it is punctuated right. (punctuation, word choice)
18. **G** Complete. Take out the phrase "the first section of" and the sentence becomes incorrect. They were not celebrating the completion of the entire New York Subway. F is correct but G is more correct. There is no evidence in the passage thus far for H or J.
19. **D** Concise. "In under a half an hour," or any re-wording of it, is repetitive. (word choice, organization)
20. **F** The question gives you the clue, referring you to the first part of the sentence that talks about "traffic jams." Only F addresses a solution to that.
21. **B** Consistent. This one is tricky. What is "that" referring to? The proposals? Even if "that" was correct, it is a singular pronoun that is inconsistent with proposals. "Those" might seem correct. But the thing that resolved the challenges wasn't necessarily the proposals but the people working on the proposals. (word choice, organization)
22. **J** Complete. This one is also tricky. This sentence really *should* have commas around "William Barclay Parsons." None of the options have commas on both sides of it. So the best option is no comma at all. G is incorrect because it would need a dash on the other side, as well. (punctuation)
23. **C** "innovative" is the only adjective in all of the choices. A would only be correct if that whole phrase was in quotes. (parts of speech)
24. **F** Concise. Complete. F is the most concise choices of F, G, and H. J makes the sentence somewhat incomplete and we are left unsure what the digging is doing. (organization, style)
25. **C** No punctuation is needed. B would only be correct if the preposition "with" was beginning a prepositional phrase. D is incorrect because a colon is not used after a preposition.
26. **G** Consistent. Here's your who/whom question! Remember: "who" is a subject; "whom" is an object, like an object of a preposition. Who begins a sentence; "whom" usually ends one. J is incorrect because deleting the phrase makes the second part of the sentence a complete sentence that cannot be separated by a comma. (usage)
27. **A** This refers back to the previous sentence. Many weren't sure about the subway, *however* they didn't take long to adapt. None of the other choices convey that contrast. (word choice)
28. **G** The clue is in the question: "describe the magnitude and expansiveness of the subway." F is a weak attempt. H doesn't give details about the number of people, only the size. J is completely irrelevant.
29. **C** This question specifically is referring to the tunnel digging technique. Where, in the essay, did it talk about that? A and B are too early. D is way out of context.

Diego Rivera: The People's Painter

30. **J** Consistent. The clue is in the question. The best word choice to correspond with “decline” is “revived.” F isn’t incorrect, neither is H. They are just not the BEST word choice.
31. **B** A, C, and D imply his work catered to the upper class, when in reality it was bringing it “to the public.” (word choice, organization)
32. **J** Clear. Sounds right. F doesn’t sound right so you know it needs to be re-worded. Which one re-words it the best? G is worded weird. H would have worked, though a little wordy, if there were commas around “for his controversy.”
33. **D** Concise. “In his art” is redundant to “artistic subject.” The other choices are also wordy.
34. **H** Consistent. The word “as” is before “expansive” and naturally goes after it, as well. “Than” is the correct use here if the word before “expansive” was something like “more.” “then” is completely incorrect. *Then* tells progression, like what happens next. (word choice)
35. **B** Consistent. This pronoun is referring to “frescoes,” which is plural. None of the other choices are plural pronouns. (usage/parts of speech)
36. **H** Complete. F and G are incorrect because a period or a semicolon makes that an incomplete sentence. A dash cuts the sentence up abruptly. (punctuation)
37. **C** Consistent. Verb tense is being tested. Look at other verbs in this paragraph: moved, hunched, envisioned. “Was” is the only past tense, plus the others are wordy. Concise! (parts of speech)
38. **F** Concise. You might be tempted to put a comma in between “various” and “prestigious.” That would have been fine if there were no other commas inserted. All of the options include extra commas.
39. **C** This information hasn’t been mentioned before, and is not necessary for the sentence to be grammatically correct. (To test that, take the phrase out and see if the sentence is still correct.) And is anything but ambiguous. Sometimes finding what is *wrong* with each of the answers helps you find the one that is right.
40. **J** Two independent clauses can be joined with a comma AND a conjunction. “Since” and “when” are conjunctions but they do not convey the right meaning in the organization of the sentence. “Thus” is a conjunctive adverb that doesn’t work, either.
41. **B** Consistent. This question is testing verb tense consistency. “Depicts” would have been the most correct choice, if you were to look at other verbs in the paragraph: portrays, shows, celebrates. “Depict” is the next best option.
42. **F** Again, the “no” options to this question are not correct. So, the answer has to be one of the “yes” answers. G is completely incorrect, so the answer is F.
43. **B** Clear. Take out the prepositional phrase “by capturing . . . workers” to see what word best leads into “celebrates.” It becomes obvious which word sounds right. (word choice, organization)
44. **J** F, G, and H all indicate a contradiction. The last sentence adds the to the meaning of the paragraph, it doesn’t contrast it. (word choice)

After All These Years

45. **A** Complete. The only other viable option in this sentence would be no punctuation at all. D makes the second part an incomplete sentence. “Yet” implies a contrast. (word choice)
46. **J** Clear. Without punctuation, it is a run-on sentence. You’re not being tested on which one is best, just which one is completely incorrect. (punctuation)
47. **C** Sounds right. A would be correct if there was a comma after “though.” The word “important” doesn’t sound right in either answer so B and D are out. (punctuation, word choice.)
48. **F** The question gives another clue. The “narrator’s positive reaction to speaking with Joan and the narrator’s fondness of her friend” are all valuable clues to the answer. Also there is a clue in the beginning of the sentence: “though we had rarely spoken to each other.” (style)

49. **B** Who is a subject. Which refers to anything other than a person. Whose is possessive.
50. **F** Refer back to the beginning of the sentence. "Through my parents" does not clump her with her parents but rather keeps her separate, which means you need a singular pronoun. The only other singular pronoun, "he" is completely incorrect. (parts of speech)
51. **B** Sentence 3 should be before sentence 2 because it explains why she would have been calling to see if they could meet up. Remember, you are trying to find the best answer. (organization)
52. **J** Concise. That phrase is really repeating information already given, so F and H are unnecessary. G is unnecessary information.
53. **D** Verb tense is being tested. "Shoned" is actually not a word. "Shone" and "shined" are the past tenses of "shine." (parts of speech)
54. **H** G seems like just as logical of an answer here. This one is a hard one. F is irrelevant. J is incorrect because the sentence adds to the story and seems necessary.
55. **A** Clear. Sounds right. The sentence gives a clue here with "familiar habits." It seems an awkward choice of words to say, "We fell upon (or dropped by, or returned with) our familiar habits." Sometimes you can insert the answer choices in and the right one will stand out. (word choice)
56. **H** Clear. This question is testing *location* with a list of prepositional phrases. Where they "would sit" should start with the most specific detail first and broaden from there. (parts of speech, sentence structure)
57. **B** Consistent. "absorbed," "engrossed," "immersed," and "engaged" are all synonyms for each other. "Acquired" means to obtain and doesn't fit here. (word choice)
58. **H** Consistent. Again, all of the words are synonyms of each other except for "along." (parts of speech, word choice)
59. **A** Look at the question for the clue: which one most "effectively summarizes the main idea"? B is too specific. C was irrelevant. D, although probably true and fitting the style of the essay, doesn't summarize the overall idea as well as A does. (style, organization)
60. **G** The logical place for this sentence is as a transition between her childhood memories and their lives as adults. This happens after paragraph 2.

Three Stars, Many Stories

61. **A** Concise. Clear. Complete. A is the most concise answer. B and C are actually not grammatically correct. B cuts the sentence short and incomplete. C includes an unnecessary comma and is wordy. Also, we don't attach something "because," we attach something "to." (sentence structure, punctuation)
62. **H** Either you need to put a period after sets and start a whole new sentence. Or you need a conjunction to join them. Without a conjunction, the sentence is a run-on sentence. J doesn't work because you would need a conjunction such as "as" to connect them. (sentence structure, punctuation)
63. **A** remember, commas come in pairs when adding detail with a clause or phrase that isn't necessary for the sentence. Lift out "or constellation" and the sentence still makes sense, which means it needs commas around it.
64. **H** This question requires you to read ahead. You could skip this question and come back to it when you are reading that paragraph. Choice H gives the most direct and detailed reference to Orion's story. The other choices are all correct, but which ones gives the "clearest allusion" or hint at his story? (style, organization, word choice)
65. **D** **Clear.** The clue here is in the question: "*visual* information." The only answer that creates some kind of picture you can envision in your mind is D.
66. **G** Find synonyms for "viewers." An overseer is a boss or supervisor. (word choice)

67. **A** Clear. The most direct connection to a "three-pronged plow" is agricultural. (style, organization, word choice)
68. **J** This answer is concise and fits the style of the author, who up to this point has not been personal or casual. F and G are too casual. H is too wordy. Shorter is better on the ACT when all answers are equally correct.
69. **A** This question may seem exactly like the previous one and you might be tempted to answer D. However, concise is only better when all answers are equally correct. Using "this" loses the important transition that this sentence is actually talking about another example somewhere else in Japan. That same reasoning applies to the other answer choices; neither indicate a different example. (word choice)
70. **G** Consistent. Verb tense/form question. Which one sounds right? Sometimes that helps. "Has" is the singular form. "Stars" is the subject. "Could of" implies a possibility instead of an absolute answer.
71. **D** Concise. Even in punctuation, you can overdo it. Simplify. Only one comma is needed after the prepositional phrase starting with "in the mythology . . ." (punctuation)
72. **J** H could be correct but is more wordy than J. F and G sound weird and imply the wrong meaning. (parts of speech)
73. **C** *Classic ACT question.* You must know the difference between they're, their, and there. It is tested in some way on almost every test. "They're" is the contraction of "they are." "their" is the possessive of "they." "there" is a place, like "over there." (parts of speech)
74. **G** This sentence needs a semicolon if left as is; two independent clauses joined together. Otherwise you need a conjunction like and. H is incorrect because joining the clauses with "with" is fine, but you would have to change the verb "span" to "spanning." J is incorrect because there is no pronoun referring back to stars. (punctuation)
75. **D** The clue is in the question: "free of direct references to a specific culture's view of the three stars." A, B, and C are all still referring to Greek or Western interpretation.

Reading Section Answers with Explanations 2014

Passage 1

Literary Narrative

"From Aboard the Night Train"

1. **D** This story is not really about riding a train, moving away from a hometown, or missing the new home she has established. A and B can also be considered incorrect because one can conclude from this story that the narrator is not a *young* adult. Too much time has past and too many changes have happened to assume this has only been a few years.
2. **H** Find the answers that do recur: dreams, reunion scenes, and train trips are recur. Photographs do not. That's your answer.
3. **B** Although there is reference to Chicago, there is no definite indication she is from Chicago.
4. **G** She indicates that things have changed (so H is out), but not necessarily improved (so F is out). No mention is made of rebuilding, only reminiscing of what once was. So G is the most correct. Find reasons why the answers are wrong in order to find the right one.
5. **B** This one just requires you to remember details, or at least go back to categorize them. Find the answers that fit in the past; cross them out to find the one that fits in the present.
6. **F** Again, this question requires you to categorize which list the answers options came from.
7. **C** This requires inference, reading between the lines to see what the narrator really meant. Especially tie into the text in that paragraph: "coming back to find his whole world changed," and "at least without a country he left behind" both indicate a symbolic rather than literal explanation.
8. **F** How can you know this? Use of the words "honey" and "beat your dad in cribbage" give it away. A neighbor doesn't usually call someone "honey." A sister would not refer to her dad as "your dad."
9. **D** At the end of line 60, she uses a colon to show emphasis. All of those changes "paled in comparison" to that.
10. **H** This one can trick you! Look at the question: "news reports attributed" his knees buckling to what? Many will put G here because it is the right answer according to what the *narrator* thought. F and J are unsubstantiated.
11. **C** All of these answers are probably correct in some way. Which one best reflects what the question is asking for: an assumption most critical for the reader to agree with? Considering the passage is about trying to make this concept provide jobs and reduce/reuse waste, C best encompasses ALL of the passages purpose.

Passage II

Social Science

"Green Music in the Rain Forest"

12. **F** In the context of this paragraph, G and H aren't applicable. J actually contradicts what the rest of the paragraph talks about, which is the movement to using other woods besides quickly depleting traditional woods.
13. **C** A and B imply negative feelings, which does not match the author's tone. D implies something that was never mentioned in the essay, although it could be true.

14. **G** H could be correct, but G is more correct, and is the purpose of the essay. J has no reference anywhere else in the passage.
15. **D** Remember, these kinds of questions refer to this specific paragraph. Some of the answers may be correct for other paragraphs, but not this specific one. The “*main function*” of this paragraph is to show other woods could be used.
16. **H** This one is tricky. H is actually *partially* correct. But nowhere in the passage does it say they have become *extinct*. The other answers were all clearly indicated.
17. **B** Why is D not correct? Yes they may have political careers ahead of them, but that’s not the point. It’s that their political careers will be influenced by their environmental knowledge and experience in the forest. A and C might be true about the students, but not the reason they will impact the survival of the rain forests.
18. **J** Easy question because the answer is clearly stated. It’s just a matter of finding it. This is where mapping the questions is beneficial because you would have watched for that statistic when you read the passage.
19. **A** Again, an easy question if you mapped the questions as well as watched the *wording* in the question. B, C, and D were all clearly listed as “traditionally” used woods. A is the *substitute*.
20. **F** Another easy question if you mapped the question. The answer is clearly shown, even in italics, on lines 65-66.

Passage III

Humanities

“Finding Philosophy”

21. **C** Although all answers are correct in some way, C *best* describes his point of view.
22. **J** Again, it seems all of those answers are correct, at least at some point in his life. Butterflies are referred to in line 54, as something that he was interested in before age 10.
23. **A** B, C, and D are all incomplete and incorrect in some way. Remember, the answer has to be entirely correct in order to be correct.
24. **J** Clues to this are found around line 25. F and G refer to the wrong person. H refers to the wrong thought process.
25. **C** He never negatively refers to those years of fascination with music so any negative reference in any answer is incorrect. A and D have no supportive evidence in the passage.
26. **F** Look carefully at word choices in each answer. “Potent” and “powerful” are both initially right. “Delicate and inevitably wasted” and “gentle” are not implied at all. So you’ve narrowed it down to F or G. However, the second part of G is completely incorrect.
27. **C** This is an inference question that takes practice to answer accurately. Anytime a question refers to “context” you know that you have to do some reading between the lines and take in the passage tone and style as a whole to get the meaning.
28. **J** You could approach this question one of two ways. You can treat it like a vocabulary test, if you know what “rudimentary” means. (Something limited to its basic or simplest form.” However, there is also something going on in each one of the answers. F, G, and H are all partially correct. But each one has something incorrect in it as well. Pen and paper are not completely obsolete, G is an opinion, and H seems dramatic.
29. **A** All three of the words have to be right in order for the answer to be right. A has the most correct words, even though some of the other answers might have one or two correct words.
30. **F** Don’t let this one trick you. Which one does NOT work? F implies something being rare and becoming familiar.

Passage III

Natural Science

"Consider the Eel"

31. **B** Main idea again. All of the answers but one are correct in some way, they are just not the *main idea*. C is incorrect.
32. **H** J is a plausible answer, but H was more correct because it encompasses the idea that the adults have to travel back in order to reproduce.
33. **D** This paragraph mainly refers to what happens in the river. C is incorrect. Only one line refers to determining the age. A is a good candidate but doesn't really transition to the ocean.
34. **J** This question is simply finding the answer in the passage in line 13-14. You could have mapped this question and answered it easily.
35. **B** Another easy question because the answer is in the text. It follows the previous question and is found in line 14.
36. **G** This question is relying on some outside knowledge of the Bermuda Triangle. Legends about the Bermuda Triangle, in particular, are not necessarily well liked or most admired. There is no proof in the passage they are scientifically accepted.
37. **B** "Read" should almost be in quotation marks here. Just as a scientist may "read" the age of a tree from its rings, this statement is implying that the age of an eel can be "read" or "seen" by looking at the rings on the skull.
38. **F** The answers in this question all seem plausible because they are referenced somewhere else in the passage. The key is to find the specific place where the eels' pupils are mentioned. That is found in line 60.
39. **A** Again, all of the answers have been mentioned in the text. You must specifically find where it mentions osmosis. That is found in line 62.
40. **F** Line 82 refers to "such small larvae" as an indication it was newly hatched. This question can be answered by finding evidence in the text.

SCIENCE SECTION EXPLAINED SOLUTIONS

1. Looking at the graph from Study 1, we can see that on Island B, the highest percent of finches had a beak depth of 10 mm, because this was the highest bar in the graph. On Island C, the highest percent of finches had a beak depth of 10 mm because this was the highest bar in the graph. So the answer is **D**.
2. It says in the text that "small seeds are abundant during wet years" and so by looking at the graph for Study 2, we find that the shortest bar in the graph is the wettest year. This year is 1984, so small seeds were likely most abundant during this year on every island. So the answer is **J**.
3. The two studies differ because Study 2 mentions nothing about capturing *G. fuliginosa* finches which were captured during Study 1, only *G. fortis* finches. So the answer is **B**.
4. Use your intuition on this one. Most researchers tag animals and so that they only count them once and they can track the same bird. So the most likely answer is **J**.
5. Look at the graph of Study 2. We see that the average beak depth during 1977 was 9.8 mm. So a bird with a beak of 9.4 mm would not survive. So the answer is **C**.
6. Looking at the graphs for Study 1, we see that the *G. fortis* had much larger beak depths on Island 1 than on Island B, reaching a maximum depth of 17 mm. This supports the hypothesis that there would be more variation in beak depths when they are forced to compete with species because this maximum of 17 mm was reached when there was another species competing for the seeds on Island A. So the answer is **F**.
7. Look at Figures 2 and 3. We notice that in February, SO_4^{2-} was maximum in February and minimum in July. So the answer is **D**.
8. Looking at the graph of Study 1 for the wet deposition for Cu^{2+} , we see that the average is between 50 and 75. So the answer is **G**.
9. Look at the graph for Study 2. Notice how the values for Cl^- were all higher during November, January, March, and April. So the Cl^- wet deposition was greater during the winter and spring months so the hypothesis is supported. So the answer is **A**.
10. If there had been no precipitation for that month, then there would be no wet deposition of any of the 4 substances because there was no rainfall. So the answer is **H**.
11. Look at the graph for Study 3. The urban sites had the greatest wet deposition. As you moved further away into the more rural sites, the wet deposition decreased for both substances. So the answer is **C**.
12. In the first paragraph of Study 1, it states that, "a rain gauge, placed on the roof of a 1-story building, at a specific urban site was used to collect precipitation." And the paragraph for Study 2 states that, "Another portion of the combined sample for each month was analyzed..." This is the same sample that was used in Study 1. Thus, the constant variable for Study 2 was the site. So the answer is **F**.
13. Examine Figure 1 because this is measuring the monthly average cover of high clouds. In 1987, the average cover of clouds was around 13.5%. So the answer is **B**.

29. Statement 5 states, "The more massive a star, the more rapidly the star passes through each of the 3 stages of its evolution." Below this statement, we see that Algol B is a solar-mass POST-MS star. The POST indicates that it passed through each of the stages of its evolution already. So the answer is **B**.

30. Statement 5 states, "The more massive a star, the more rapidly the star passes through each of the 3 stages of its evolution." Because Algol A is more massive than Algol B, we know that Algol A will pass through the 3 stages quicker. So the answer is **H**.

31. Look at Figure 2. Looking at the line for Kr we can see that it is slowly increasing. For 13g it would be between 400 torr and 800 torr. So the answer is **C**.

32. Look at Figure 2 because this is a 6 L vessel which is closest to 5 L. The values in the 5 L would have been a little higher than they are for the 6 L vessel. So the pressure exerted by the 7 g CO₂ would have been between 500 torr and 1000 torr. So the answer is **G**.

33. Compare the two different O₂ lines at the same point. We find that the 3 L vessel is always twice as high as the 6 L vessel. So the 6 L vessel will be $\frac{1}{2}$ as great as in the 3 L vessel. So the answer is **A**.

34. By looking at the Figures we can see that O₂ is always greater than CO₂, so answers F and G are out. We also know that there are more O₂ molecules than CO₂ molecules at any given time. So the answer is **J**.

35. The current experiment is being done at 22 degrees. If the pressure was measured at 14 degrees then the pressure would have been less because we know that pressure is proportional to temperature. (Think of a blown up balloon on a hot day... the balloon shrinks as the temperature increases.) So the answer is **A**.

36. The threshold of hearing line stops at 2×10^1 , which is the scientific notation for 20. So the answer is **G**.

37. The question asks about hearing loss for HIGH frequencies. So the before loss line should be higher than the after loss line on the graph. This is true for graph A. So the answer is **A**.

38. The question asks about the highest INTENSITY, which is what is being measured on the x-axis. So the highest value is when S=100% in the water. So the answer is **F**.

39. This hypothesis is not supported because the maximum Hz threshold of pain is 2×10^4 . 10^5 cannot even be heard. So the answer is **C**.

40. The question asks if S depends on the frequency of the sound wave. It does not because as the frequency increases along the y-axis, S remains constant. So the answer is **J**.