Bluebook 10

Question explanations to accompany SAT practice test #10

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Problem 1

Official Answer: A

We need an adjective to describe the use of his script. What do we know about the use of his script? The clue comes after the colon. Over 90% of people could use it. Its use was widespread.

Problem 2

Official Answer: C

As you were reading, what word did you expect to find in the blank? "Understand"? Are any of the four word choices similar to "understand"? It wouldn't really make sense to "delegate" or "renounce" poems, so we can rule out A and D. The poems might very well have been difficult to compose, but then you would say they *were* difficult to compose, not that they *can be*. And anyway, being difficult to compose probably wouldn't have made them the object of debate among scholars. "Interpret" isn't an exact synonym for "understand", but it's the closest we've got.

Problem 3

Official Answer: C

In this case, the clue is in the introductory stuff. If you look at the blank and the answer choices, you see that we are looking for an adjective to describe this person's effort, and the "this" in "this _____ effort" hints that they just described it in the previous clause. If you look at the previous clause, you see that she "continuously worked." So we are looking for an adjective similar to "continuous." "Ongoing" maybe? That's not an answer choice, but "persistent" is.

You probably at least have a sense for what "impartial" and "offhand" mean, and you've probably heard of "mandatory requirements" in school. If you don't know what "persistent" means, perhaps you've heard of "persist". "Persevere" is similar. So among the alternatives, "persistent" is the closest in meaning to "continuous".

Problem 4

Official Answer: A

Slowing the currents and calming the seas would make the environment more ... what? If you know the meanings of all four words, the answer should be obvious. If you don't know the meaning of "tranquil", you probably at least know the other three and can see that they don't make sense.

Problem 5

Official Answer: B

The clue comes after the colon. What's a good adjective to describe something that has no direct bearing? It's irrelevant.

You might be distracted by some of the other answers, because they all start with the letter "i" and they all sound similar. If so, try ignoring the prefixes. If something *did have* a direct bearing on something else, would it be distinct? Relevant? Disputable? Explicit?

Problem 6

Official Answer: B

What's the gist of this paragraph? The subject of four of the five sentences is "jazz tap". What is this paragraph saying about jazz tap? The paragraph is more or less a history of the evolution of the art form. So perhaps we could say "it explains how jazz tap developed". Answer B doesn't refer to jazz tap specifically, but otherwise it's spot-on, and the others are all ridiculous. There is no discussion of what audiences prefer, there are no instructions or musical instruments, and there are no individual dancers mentioned.

Problem 7

Official Answer: A

This is a "main purpose" question, so just try to get a sense of the forest for the trees, without getting bogged down in details. How would you summarize what's going on? The speaker is trying to be reassuring in regards to a certain play. After observing just this much, you might think that C can be ruled out completely, and that A looks pretty good. Can we confirm that A is the best answer by hunting for more details? The words "unexceptionable" and "no harm or danger" seem to indicate that the play will be "inoffensive". Tom never tells us that the play will "involve only a small number of people", but the SAT preface-writer does, with the words "a group of his friends and family". Tom never mentions earlier plans (B), nor the skill level of the promoters (D) or of anyone else involved in the play (C), so A is the best of the four summaries.

Problem 8

Official Answer: C

We are looking for a statement that both authors would agree with, so let's find the similarities and differences

between the two paragraphs, and then focus on the similarities. The first paragraph describes how Degas (as an example of Impressionist painters in general) insisted on keeping his paintings in painted frames instead of gold frames as a way of standing out from his peers. The second paragraph claims that Impressionist painters chose painted frames for visual aesthetic reasons. They agree that Impressionist painters preferred painted frames over gold, they disagree about the reasons.

Answer A isn't even close. It focuses only on gold frames, and it brings in the motives of the customers, about which we know nothing. Answer B is backwards. The painters would have chosen the frame to match the painting, not the other way around. Answer D is garbled. We have no idea what author 2 thought about Degas in particular, and author 1's opinion of Degas is the opposite of this. Degas was "like many Impressionist painters", not different from them.

This leaves only answer C, which is pretty vague, but completely accurate. Both authors would agree that Impressionist painters were particular about the frames that they chose.

Problem 9

Official Answer: A

This looks like a fact-finding question, but it's a little broader than most. An "approach to art" could mean many things. If we scan the text, looking in particular for information about Gibson's approach to art, we find lots of information that may or may not be relevant.

At first glance, you might think this paragraph is going to be about combining modern punching bags with traditional crafts. Mr. Gibson's punching bags are in fact the subject of another SAT question elsewhere, and the blending of "contemporary art and traditional crafts" is indeed the subject of that question. But the bulk of this paragraph is about male versus female, rather than modern versus traditional. And yet, frustratingly, there is nothing in the answer choices about male versus female.

As so often happens in the SAT reading questions, it is easier to reject wrong answers than to understand the reasons for the correct answer. So let's check the four choices, one-by-one. Answer A seems very narrow, given the broader theme of the paragraph, but it's perfectly accurate. We can rule out answer B because the influence of other artists on Mr. Gibson was never discussed. Answer C is a cheeky attempt to catch sloppy readers. The paragraph mentioned dresses, but Gibson didn't make them. And the paragraph mentioned that Gibson incorporates beadwork, but it never said anything about how he does so, so answer D has no basis. Answer A says nothing about punching bags, nor about male or female roles, and both of these things are important aspects of Mr. Gibson's work as presented in the paragraph ... but it's the best choice among the four.

Problem 10

Official Answer: D

What's the main topic of discussion here? Perhaps you could say something like this: "Living in weird places is healthy." Now let's nitpick.

A — This looks good ... until you reach the last three words. Did any part of the passage say anything about sustainability?

B — This looks good ... if you overlook the words "most effective". No part of the passage made any comparisons or claimed that weird places were *better* than other things.

C — This might look good on a casual reading, but check the details. Yamaoka was a filmmaker, and he lived in the weird building, but is it true that he has *long supported* such designs? The passage never said so.

D — This is the only answer that doesn't have flaws.

And as long as we're nitpicking, would *you* find your well-being improved by having to work at countertops that were knee-high, or by having doors in the ceiling over your head? Are we supposed to take seriously one anecdotal report of the "significant health benefits" of such a ridiculous place? And why do the SAT writers love bizarre modern "conceptual artists" so much?

Problem 11

Official Answer: A

What's the team's idea? That shifting colors makes insects harder to see. What sort of evidence would support this idea? If animals (possibly including humans) see constant colors but miss shifting colors, that would do it. In the context of the experiment mentioned in the passage, this means that participants would find lots of purple and blue wings, but not as many iridescent wings. That's answer A.

Answer B also distinguishes between iridescent wings and purple and blue wings, but it focuses on the *speed*

with which the people found the wings, which may or may not be beside the point. But in any case, it favors the iridescent wings over the purple and blue wings, which is backwards. Answer C distinguishes between purple and blue wings, which doesn't help, and answer D doesn't mention the colors at all.

Problem 12

Official Answer: B

We need to illustrate a boy seeing people as always carefree. Answer A is wishy-washy. You could read "you don't wish to stop" as indicating carefree, but you have to imagine that the person is engaged in some light-spirited activity for that to work. Furthermore, the rest of the words after the semicolon indicate that "stop" refers to motion, not enjoyable activity.

Answer B mentions glad feet and anklets jingling merrily, which seems pretty cheerful and carefree. We are supposed to illustrate people being seen as carefree *even when engaged in work or chores*, and it isn't clear if we are supposed to take flower gathering as a fun activity or as a chore, but if we take the time to study the passage, we see that it does tell us that the boy is addressing the daughter of a flower-seller, so we can assume that she is engaged in work. In any case, answer B does seem to convey the boy's impression of people as being carefree.

Answers C and D tell us about the boy himself, not how he views anybody, so we can rule those out, confirming that B is the best answer among the choices.

Problem 13

Official Answer: B

What's the conclusion that we need to weaken? That lizards were the only reason for the loss of spiders. Do you see any noteworthy patterns in the graph what would *weaken* this conclusion, i.e. show support for something other than lizards? The spider populations in both cases decline with time, but the decline with lizards is more rapid. If lizards were the only reason for the loss of spiders, why would the populations decline without lizards? There isn't much else that you can say about the graph, not without getting finicky and looking at exact numbers, so the correct answer will probably say something like this: The population in the enclosures decreased even when there were no lizards. That is supported by the graph, it weakens that claim that lizards were the only reason, and this is pretty much what answer B says.

You might want to check the other answer choices, just to confirm that there isn't a better choice. Answer A *should* be true regardless of the outcome of the experiment. If it *weren't* true, it would have been a poorly designed experiment. Answers C and D are both true, but C doesn't have any bearing on the conclusion, and D actually *supports* the conclusion rather than weakening it.

Problem 14

Official Answer: A

You might have to read this twice to catch the key issue, because it's easy to miss the first time through. The first sentence states that many existing repellents activate *multiple* receptors. The second sentence worries us with the problem of resistance, and then the third sentence tells us about a chemical that activates *just one* receptor. One could imagine different valid conclusions, but the natural conclusion seems to be that we should use repellents that target only one receptor at a time, so that when mosquitoes develop resistance to one, we can move on to another.

Reading through the answer choices, answer A seems merely adequate, but none of the other answers work. Answer B is a non sequitur. It may or may not be worthwhile to find other ways of obtaining EBF, but the paragraph said nothing about whether obtaining EBF was difficult or not, so it doesn't follow. The paragraph also said nothing about where the receptors were located nor anything that indicated that the locations are a significant issue. Like the locations of the receptors, the number of receptors is also a non-issue (judging from the given paragraph) so answers C and D are also non sequiturs.

Answer A recommends targeting one specific receptor, presumably based on the claim that this receptor is known to be present in all disease-carrying mosquitoes. This leaves open the issue of what to do if and when the mosquitoes develop resistance, but for the time being, it's a perfectly good conclusion. Answer A fails to address the issue of resistance mentioned early in the paragraph, but it does follow naturally from the previous sentence.

(Narrowing your focus is a risky strategy on the SAT, because you might overlook something important. But in some cases it can be helpful. In this case, if you restricted your attention to the last three lines, you might have been able to reason this way: "this receptor is present in all disease-carrying mosquitoes, so we

should target this receptor." That would have ignored the issues of resistance and of single versus multiple receptors, but it would have led you directly to answer A.)

Problem 15

Official Answer: D

This one is relatively straightforward. Leafy spurge is bad, and we can kill it with chemicals, but this also harms other plants. If we could target leafy spurge exclusively, what effect would this have? It would mean that we could kill leafy spurge without harming other plants. That may seem a little repetitive or redundant, but that's what answer D says, more or less.

Using a new method of harming leafy spurge wouldn't make it more susceptible to existing herbicides. (Well, it might, but we have no reason to conclude that it definitely would.) So conclusion A is unjustified. It also wouldn't change them from being harmful to harmless (answer C) or even beneficial (answer B).

Problem 16

Official Answer: C

The answer choices are a mix of commas and conjunctions, and they need to go in a blank in the middle of a long series of words. Start by looking at the stuff before the blank and the stuff after, and deciding whether they are independent clauses or merely supporting material. If you put a period after "lifelike", then the stuff before doesn't make sense. It's a sentence fragment, not an independent clause. The stuff after the blank still works, however. "Others look to the past" can stand on its own as an independent sentence, and is a valid independent clause. The only proper way to join an introduction and a main idea is with a comma. Answer C makes a valid "Intro, Main Idea" pattern. Adding the "but" clashes with the subordinating conjunction "while" at the beginning of the sentence. You can use one or the other, but not both. (If you omitted the "while", then answer D would be the correct answer.)

Problem 17

Official Answer: D

Yes, we're all aware of how chaotic the Earth's rotation is. Sometimes we only have 18 hours in a day, sometimes 27. It's a wonder we have any kind of regularity in our lives at all. (Leap seconds are added to our time standards roughly once every year and a half, on average. That's a discrepancy of about one part in 47 million.)

As usual, we see a long series of words with a blank in the middle, so let's start by experimenting with a period after "added". "An extra second is added" can stand on its own and constitutes a valid independent clause, but the stuff after the blank cannot and does not. We might be dealing with the "Main Idea, Followup" pattern, in which case a comma would be appropriate, but in this case, the stuff after the blank is adverbial. It is needed to elaborate on the stuff before the blank. It is not "optional extra" and it should not be separated from the rest of the sentence by any punctuation marks.

Problem 18

Official Answer: C

We need to make two choices here. We need to properly apostrophicize both "playa" and "rock". First of all, do we need apostrophes at all? Yes. Both words are possessives, describing the "owners" of the sediment and of the migration. So both words need an apostrophe somewhere, and we can rule out A and B. The next question is whether they are singular or plural. Is there one playa, or are there more than one? We are talking about one particular playa, the Racetrack Playa, and there are no exceptions (not on the SAT, anyway) to the rule for singular nouns: to make them possessive, always add apostrophe+s. This makes D incorrect, leaving only C. The reason "rocks'" has the apostrophe after the "s" is that it is a plural noun that was made plural by adding an "s". If you already added an "s" to make it plural, don't add a second "s" to make it possessive. Just add the apostrophe.

Problem 19

Official Answer: C

You might notice that there is one answer choice with a "strong mark", and three answer choices with mere commas or with no punctuation at all. If you want to confirm that the colon is indeed the correct answer, perform the two colon tests: check for an independent clause before the colon, and make sure that the clause before the colon is working as an introduction for the words after.

"Light intensity affects the rate of photosynthesis" is a valid independent clause, and the words after the colon elaborate on this idea, so the colon is perfectly appropriate.

You can also conclusively rule out the other answers by noticing that "as intensity increases, so does the conversion rate" is another independent clause. You can't join two independent clauses with a mere comma, or with no punctuation mark at all.

Problem 20

Official Answer: B

If you notice the "profession Individual Names" pattern, you can immediately rule out answers A and D. On the SAT, the proper nouns are almost always essential to the sentence, and should not be separated from the profession by commas. (Technically, the names are a "restrictive appositive", supplementary nouns that are essential to identifying who we are talking about.)

The remaining question is whether there should be a comma after the last name or not. This is not a boundary between clauses or parenthetical content, it is merely the end of a prepositional phrase, so there is no justification for placing a comma or any other mark of separation at this location. The correct answer is the one with no commas. (It often is, especially when you see the "profession Individual Name" pattern.)

Problem 21

Official Answer: A

The first sentence describes someone discovering something weird. The second sentence tells us that this anomaly was named after the discoverer. These are not two similar things, so "similarly" is not appropriate. They are not contrasting things, so "however" is not appropriate. And the second is not a restatement of the first, so "in other words" is not appropriate. The second is a consequence of the first, and if we wanted to emphasize the causal sequence we could say "consequently". But if we simply want to emphasize the appropriateness of naming something after its discoverer, we can say "fittingly".

Problem 22

Official Answer: D

How are the two sentences related? The first sentence describes a poll indicating that Kennedy lost badly. The second indicates that he actually won. That's a contrast, requiring a contrasting word like "nevertheless". The second sentence does not constitute a restatement or a consequence, so neither "in other words" nor "therefore" are appropriate transitional words. It also does not describe a similar or parallel situation, so "likewise" is also inappropriate.

Problem 23

Official Answer: D

How are the two sentences related? The second sentence elaborates or expands upon the first by providing more details. If you think that the second sentence provides an emphasis, an emphasis word like "indeed" or "in fact" would be ok, be we aren't offered any of those. Since the second sentence provides additional details, "specifically" is more appropriate.

"Finally" is clearly wrong because the second sentence does not present the last item in a sequence. "Similarly" is not appropriate because the two sentences do not describe two separate but similar things. They describe the *same* thing, one broadly and one specifically. And finally, "therefore" is not appropriate, because the second sentence does not describe a consequence of the first.

Problem 24

Official Answer: A

What's the goal? To indicate where the fossil was found. The last bullet point tells us: it was found in the Thar Desert. Only one answer choice mentions the Thar Desert...or any location at all, for that matter, unless you count the Indian Institute of Technology.

Problem 25

Official Answer: C

What's the goal? To specify the reason the Pleiades' appearance changed. If you jump to the answers at this point, looking for easy rejections, you can probably rule out all three wrong answers. They all allude to the appearance, but neither A nor D refer to a *change* in appearance. Answer B implies a change in appearance, but it does not give a reason. Only answer C gives a physical reason for the change in the appearance.

After reading the prompt, you could also have jumped back to the bullet points, looking for the reason the appearance changed. It's in the last bullet point, which tells us that the stars moved. Answer D refers to two stars being close together *now*, but only answer C refers to moving stars.

Incidentally, if you own a pair of binoculars, try to find the Pleiades at night. They're beautiful.

Problem 26

Official Answer: A

What's the goal? To emphasize the significance of Ochoa's discovery. We could try scanning the answer choices at this point for easy rejections, but all four of the options include "Ochoa" and "discovery" or "discovered". Scanning the bullet points for the discovery and its significance, the fourth bullet point seems like the important one. "The discovery proved critical to deciphering the human genetic code." Answers A and D both include "critical to deciphering the human genetic code", but answer D includes these words in an introductory clause and then goes on to give other distracting information. This is not *emphasizing the significance*. Answer A states the significance, and goes on to provide the elaboration on the significance provided in the fifth bullet point.

Problem 27

Official Answer: C

What are the goals? To "emphasize the decline in unique apple varieties in the US and specify why this decline occurred". So the correct answer will probably contain some amazing figures showing how many fewer varieties there are now, and it also needs to give a reason. If there is no emphasis on the decline, or if there is no reason given for it, it won't be the correct answer. Scanning the notes, we find the figures: There used to be 14,000 varieties, now there are only 15. The reason given in the notes is "industrial agriculture".

Answer A alludes to the reason, but doesn't give any figures. Answer B contains the figures, but doesn't give a reason. Answer C doesn't give exact numbers, but it does say "thousands", and it also mentions "industrial agriculture", so this is probably the correct answer. Answer D mentions the reason and the decline, but it doesn't give any numbers at all, thus failing to provide "emphasis", and it is therefore not as good at accomplishing the "goals" as answer C. You might also notice that answer D forgot to mention "apples", and only referred to "crops" in general.

Problem 1

Official Answer: A

The sentence containing the blank is brief and uncomplicated, and the four word choices are all fairly common. You can probably answer this one just by testing the four words in the blank. "The store was a source of information." "The store was a rival of information." "The store was a condition of information." "The store was a waste of information." The final sentence gives additional context clues, but you don't need them, because none of the wrong answers make any sense.

Problem 2

Official Answer: D

If you know the meanings of all four words, this one shouldn't be too difficult. What would a harvesting method do to wild populations? Three of the answer choices don't make much sense, but if you want another clue, look after the colon. The harvesting method "repopulates the space" and results in an "overall increase in number and vigor." Which of the four choices is the best synonym for "repopulate"?

Problem 3

Official Answer: B

We need an adjective to describe the process of recycling. The rest of the passage describes an alternative process that is "cleaner". So we need a negative adjective to contrast with "clean". The only negative adjective in the list is "inadequate". (If you don't know what "resilient" means but you think "inadequate" works, you should go with "inadequate". If you don't know the meaning of two or more words, you may just have to guess.)

Problem 4

Official Answer: A

You probably know what "hibernate", "predict", and "moderate" mean, and you may feel that none of them really work. If you know the meaning of three words and none of them seem right, you should probably go with the word you don't know.

The "dodder achieves this _____", so we are looking for an action that the plant performs, and the word "this" hints that they described the action in the previous verbiage. Looking in the previous verbiage, we find that the action in question is a flowering. And you wouldn't refer to a flowering as a "hibernation" or a "prediction." You might not be confident in ruling out "moderation". Maybe you think that it sounds similar to "modification". But if you have to choose between a word that might work but doesn't sound right and a word that you don't know at all, it is probably better to choose the word you don't know.

If you know what "synchronize" means, you probably realize that this is the correct answer. It means to time an action so that it runs in parallel or in rhythm with another action, and that's exactly what the dodder is doing when it flowers. It is flowering at the same time as the host plant.

Problem 5

Official Answer: D

What's the gist of the paragraph? Max wants his father to take him to see the haunted fortress. That's answer D. The other answers are all out in left field.

Problem 6

Official Answer: C

This is an "overall structure" question. Read through the passage (since this is poetry, it may help to read it several times), and try to figure out the events and how they are arranged.

Does the passage present "alternating descriptions" of anything? Do you see any reference to city or country? Answer A doesn't hold water. Does the passage sketch an image of nightfall, then an image of sunrise? It does mention "night" twice, at the beginning and the end, but where is there any mention of sunrise? Let's rule out answer B. Does the passage make an extended comparison of night to a human being? There does seem to be a lot of night going on. Is it being compared to a person? ..."draws a veil"..."black of her hair"..."subtle hands"... We might quibble about whether it is "extended" or not, but there is anthropomorphism happening here. So answer C is ok. Does the passage portray how night changes from one season of the year to the next? Do you find any reference to the passage of seasons or years? Let's rule out D and choose C.

Problem 7

Official Answer: D

If you jump to the question prompt, you see that this is a fact-finding question, and they tell you what fact

to find. Go back and read the paragraph, looking for automotive activities. You don't have to look very far. In the first sentence you read that they played license plate games. Are any of the other answers even close? Try to find books, songs, or sleeping anywhere in the passage.

Problem 8

Official Answer: A

This is another fact-finding question. Go back to the paragraph and look for Gloria Richardson leading something. The first sentence tells us that she led a movement to promote equality, but that's not one of the answer choices. Expanding our search radius, we can discover that Gloria joined a variety of movements, protests, and committees, and at the end we discover that one of them became known as the Cambridge movement, which is answer A.

Problem 9

Official Answer: A

What's the conclusion? Cattle close, sheep and goats far. How are we supposed to support this conclusion? There is no chart or data table to check, so let's just summarize the passage and then check the answer choices.

Passage summary: We're looking into the prehistoric domestication of farm animals, and we can tell whether an animal ate wild food or domesticated crops. Cattle ate crops, but sheep and goats ate wild food, so maybe cattle were domesticated and the others weren't? Now let's look at the choices and see which one support the conclusion.

A — Another domesticated crop forming another element of the cattle's diet would definitely strengthen the link between cattle and people and help support the conclusion.

B — If the "roamers" were found to have eaten a domesticated crop, this would *weaken* the conclusion. It would imply that sheep and goats were raised closer to people, not farther away.

C — The dietary requirements of cattle were not an issue.

D — Variation with location was not an issue.

Problem 10

Official Answer: D

There is a bar graph, and the answer choices are all represented by bars in the graph. This is a simple graph-reading question. They ask for the the species with the highest global biomass, and the tallest bar is that for white-tailed deer. (Do we really need a legend telling us that all of the animals are "species"? Legends are helpful when you are graphing more than one variable. Here, it's silly.)

Problem 11

Official Answer: A

There is a table, and all four answer choices identify one row in the table. This is a simple table-reading question. They ask us for the highest number of housing starts, and the row with the largest number is that for April.

Problem 12

Official Answer: B

They give us a table of data, and the answer choices all discuss rates, so let's start by checking the four choices for factual accuracy. It isn't always this easy, but in this problem you can rule out all three wrong answers because they are all factually inaccurate. Answer B is the only one that is true.

This question almost seems like the SAT is asking us to practice the art of spin. You might notice that the slowest-spoken language has the lowest information rate, and the fastest-spoken language has almost the highest information rate, yet they ask us to support the conclusion that speech rate doesn't matter ... based on only five data points. Try using a spreadsheet to make a dot plot of these five data points and see if you can draw any meaningful conclusions from the pattern.

Problem 13

Official Answer: A

What's the claim? That "Chambi's photographs have considerable ethnographic value." What does that mean? They tell us what it means after the dash: the photographs document "diverse elements of Peruvian society, representing his subjects with both dignity and authenticity." What would support such a claim? Seeing lots of photographs of all kinds of Peruvians. Examples of photographs that show lots of different people

from different walks of life. Something like that. Now let's check the answers.

A — This mentions photos of wealthy Peruvians, as well as "hundreds of images carefully documenting the peoples, sites, and customs of Indigenous communities of the Andes." That's a pretty clear statement of abundant ethnographic photographs.

B — How would his skill as a photographer prove that his photographs are ethnographically valuable? (Skillfully made photographs are probably more valuable than clumsily made photographs, but the skill level has nothing to do with ethnography, and notice that the prompt asks for the finding that *most directly* supports the claim. This one provides indirect support, if any at all.)

C — Being popular doesn't necessarily mean your photographs are valuable.

D — Taking pictures of popular subjects doesn't necessarily mean your photographs are valuable.

Problem 14

Official Answer: A

How would familiarity with the bureaucracy of both the military and civilian branches of government increase the number of military people going into civilian government? It would _____? What would you expect in the blank? "Make them better at government jobs"?

A — Ok, this says that the jobs are more *appealing* to the workers, not that the workers are *better at the jobs*, but it works just as well.

B — Huh? If an answer makes no sense to you, it probably isn't correct.

C — This is a complete non sequitur. The paragraph was all about veterans. Nonveterans are nowhere to be found.

D — This is also a complete non sequitur. Whether or not someone serves in the military has no bearing on the how many jobs are available.

Problem 15

Official Answer: C

Here's a pronoun question. Whose findings are we dealing with? Watson and Crick, i.e. two people, so we need to use the plural pronoun "they" and not the singular pronoun "it". Now, should we pick "their" or "they're"? If you aren't sure, you should review contractions versus possessive pronouns, because this issue comes up a lot on the SAT. In this case, we need a possessive, to tell us whose findings we are talking about. So we need to pick the possessive pronoun "their".

Problem 16

Official Answer: A

You might notice that there are three "modified verbs" and one "true verb" among the answer choices, which should make you suspect that the true verb is the correct answer. (The "modified verbs" are the ones with "-ing" at the end or "to" at the beginning.)

To confirm, find the subject that goes with the verb. What is it that is providing guidance? The Handbook. If you make simple sentences with this subject and the four verb choices, can you pick the right one?

The Handbook provided guidance.
The Handbook having provided guidance.
The Handbook to provide guidance.
The Handbook providing guidance.

Problem 17

Official Answer: B

This one is classified as "easy", but it's pretty tangled. You might be able to choose the answer that sounds best simply by reading the sentence four times, once with each answer choice in the blank, but it's a long sentence.

The four choices are all forms of the verb "create". What is doing the creating? The lock. Try forming simple sentences with this subject and each of the four choices. Be careful, however, because there's something sneaky going on. The word that goes in the blank needs to be the second verb in a compound predicate with a shared helping verb. The pattern is this: "The lock would do this and that." So be careful to include the helping verb "would" in your simplified sentences, because it will affect the answer.

The lock would creates...
The lock would create...
The lock would creating...
The lock would created...

Problem 18

Official Answer: C

Here is another long sentence with a blank in the middle. Try placing a period after "percent". We are dealing with two independent clauses ("consumption decreased by up to 90%", and "taxes are subject to the rebound effect"), and a comma is not strong enough to hold together two independent clauses. They don't offer us a comma and a conjunction, but they do offer us a period and a capital letter, effectively splitting the two independent clauses into two completely separate sentences. Logically and stylistically, one might have hoped for a contrasting transitional word, but as far as the punctuation is concerned, answer C is perfectly valid, while the others are all insufficient.

Problem 19

Official Answer: C

Any of these verbs could work grammatically with "The character _____" so we need to look at the rest of the passage to decide which tense to pick. The first half of this sentence describes events in *The Book of Salt* in the present tense, so the second half should describe events in *Bitter in the Mouth* in the same tense. Only answer C is in the present tense.

Problem 20

Official Answer: A

Often in punctuation questions there will be three "weak joints", with commas or no punctuation at all, and only one "strong joint", meaning a semicolon, colon, or period, and the correct answer is virtually always the single "strong joint". In this case, it's the other way around, but before we assume that the "weak joint" (i.e. answer C) is the correct answer, let's check. Periods and semicolons can often be used interchangeably, but colons have important differences. The colon might be the correct answer.

Let's start the way we usually do with "boundary" questions, by looking for independent clauses. "The goals were threefold" can stand on its own and is a valid independent clause. "To do A, B, and C" is a list, not an independent clause. This makes B-D all invalid. The colon is in fact correct. The independent clause introduces the list, and the colon marks the place where the clause ends and the list begins.

Problem 21

Official Answer: A

This is a "transition" question, but it actually contains a whole string of transitions, which may or may not be good writing. "That is" indicates that the second sentence is a restatement or clarification of the first sentence. "However" indicates that the third sentence is a contrast or counterpoint to the second sentence. And the word in the blank needs to relate the fourth and final sentence to the third sentence. How are they related? The third sentence provides a general truth, and the final sentence mentions Larch trees specifically. "For example" is not offered as a choice, but "for instance" is, and none of the other choices are appropriate.

Problem 22

Official Answer: A

How are the sentences related? The sentence preceding the blank discusses the past discovery of the lines, and the sentence containing the blank discusses modern technology that helps study the lines. "Nowadays" or "Today" might work, but those aren't given as options. "Currently" is the only word that brings us from the past to the present.

You can probably rule out answers C and D fairly confidently. Those are both contrasting words, and the two sentences do not conflict with each other. You might be able to make a case for "In comparison" as an acceptable way to begin the sentence, but for that to work, you would need to add additional words that bring us into the present and state clearly what it is that we are comparing. "In comparison to the methods of the past, modern archaeologists use ..."

Problem 23

Official Answer: B

How are the two sentences related? The first makes a broad claim about "organisms" in general, and the second refers to embryos of a particular species. The second is an example of the first.

Problem 24

Official Answer: A

How are the two sentences related? The sentence before the blank says "Ifemelu went to the US" and the sentence containing the blank says "Obinze went to London". So this is either a contrast or a parallel. "Never-

theless" doesn't really make sense here, because we are not contrasting the two experiences, merely relating two different experiences that happened at the same time. So "Meanwhile" is best.

Problem 25

Official Answer: B

What's the goal? To emphasize the effect media had on building Wong Fei-hung's legacy. The fourth bullet point is the one that gives us the information we need. In an nutshell, media made him an "internationally known folk hero". Both answers B and C include the words "internationally known" and "media", but answer C doesn't say that he became internationally known *because of* the media.

Problem 26

Official Answer: B

What's the goal? To compare the lengths of the two tunnels. The correct answer needs to mention both tunnels and their lengths. Answers A and C only mention one tunnel, so those are clearly wrong. Answer B mentions both tunnels by name, accurately states both of their lengths, and even points out the implication: the Channel Tunnel is "slightly shorter" than the Seikan Tunnel. So B is perfect. Answer D mentions both tunnels by name, but focuses on their locations rather than their lengths.

Problem 27

Official Answer: C

What's the goal? To emphasize the duration and purpose of their work. Searching the bullet points for relevant information, we don't find much about the duration, except that they both started something in 2003. We don't find much about the purpose, either.

Only answer C contains "2003", so let's start with that one. It does mention a duration ("since 2003"), and a purpose ("to preserve Gullah culture through their museums"). The notes never explicitly say that this was their purpose, but it is a perfectly reasonable inference, so this is probably the best answer. Answers A and D don't mention the two women at all. Answer B mentions their work, and it does give a duration, but you'll notice that it's the wrong duration. Answer B gives the time the Gullah people have lived in the area, not the time these two people have been working.

Problem 1

Official Answer: D

What might fine art and fashion do? Look at the first two answer choices. They both have to do with winning or losing. Are we talking about fine art and fashion collectively succeeding or failing?

Look at the last two answer choices. They have to do with things either moving apart or coming together. Could fine art and fashion come together? Could "intersect" be another word for "overlap"? That would make sense in the context, wouldn't it?

Problem 2

Official Answer: C

If we don't have much evidence about her reign, we are unlikely to ever have what kind of an account? Thorough? Certain? We need some kind of positive word for a state of knowledge.

We can have as many imaginative accounts as we want. We just have to imagine them. Superficial and questionable accounts are what we already have. "Superficial" means "on the face of things" or "only skin-deep". What we lack is a comprehensive or thorough or *exhaustive* account.

Problem 3

Official Answer: C

What kind of influences are they? The description after the colon tells us. There's a list of three different styles from three different places. Would "diverse" be a good word to describe this collection? Are any of the answer choices similar to "diverse"?

"Complementary" means they go together, and that's the opposite of what we want. "Interchangeable" means they are equivalent. You can replace one with the other. That's also not what we want. And if the influences were "unknown", the writer wouldn't have been able to list them after the colon. "Disparate" refers to numerous things far apart, and it's the best synonym for "diverse".

Problem 4

Official Answer: A

This entire paragraph is one long, convoluted sentence full of wishy-washy words. Conjunctions or conjunctive adverbs that signify a contrast are usually clues in vocabulary questions, and you may notice the "but" in this one. This sentence-paragraph is attempting to set up a contrast, but what exactly is being contrasted? The words after the "but" seem to be stressing a bad thing, while the words before the "but" seem neutral. Are we contrasting effects on different groups of people, or are we contrasting good effects with bad effects?

If we try to distill the essence of this paragraph, it seems to be saying something like this: "People usually say that delaying payments to retirees is a bad thing for the retirees, but this other person says that it's a bad thing for their children as well." How is it a bad thing? It apparently hurts wealth creation somehow. So we probably need a word for the blank that means something like "harm", "stifle", or "delay". Are any of the choices an appropriate negative word?

You probably realize that "compound" doesn't make sense, and "outstrip" just doesn't sound right. "Disparage" is a negative-sounding word, but that's something a person does with words. The action of "delaying transfers" wouldn't bad-mouth wealth creation. That just leaves "stymie", which sounds similar to "stifle", has a similar meaning, and is the correct answer.

As a side note, the SAT presumably wants to test your ability to think clearly and critically, but critical thinkers should be very uncomfortable with the kinds of wishy-washy words being used here. The expression "wealth transfer" is especially concerning. There are all kinds of ways that wealth can get "transferred". Some of them are productive and voluntary, others are criminal and reprehensible, and it is not healthy to blur such an important distinction.

Problem 5

Official Answer: A

This is an "overall structure" question. When you read the paragraph, pay attention to the sequence of steps, like looking for the plot of a novel (or subplot, perhaps, considering that this paragraph was actually taken from a novel).

All four answer choices come in two parts. They begin with one thing, and then they end with another thing. We can ignore Atlante giving the letter to Charlot. Atlante's role in the story is finished before the first semicolon. Most of the first half of the paragraph describes the delivery of the letter from Charlot to Rinaldo, and the last few lines describe Rinaldo's reaction upon reading the letter. So the first half of the answer should probably describe the delivery, and the

second half should describe the reaction. That's answer A.

Answer C might be tempting upon a casual reading, but it doesn't pass scrutiny. Charlot's concerns about dropping the letter were a minor detail, and we have no idea what was in the letter. We know the reaction that it provoked, but we don't know the contents. Similarly, the second half of D is plausible, but the first half is wrong. Based on the given paragraph, we have no idea who wrote the letter nor why. And neither half of answer B is correct.

Problem 6

Official Answer: D

With more difficult Reading & Writing problems, it might help to start by scanning the answer choices quickly, ruling out the ones that are clearly wrong, and then start nitpicking the rest, looking for more subtle disqualifiers. In this problem, you can probably rule out answer B pretty easily. The sentence definitely doesn't convey an internal conflict.

We still have A, C, and D to pick from, so get ready for nitpicking. Pay close attention to each meaningful word, and ask, "Does the underlined sentence really do this?" Answer A seems quite plausible at a casual glance. The sentence definitely involves the physical setting. But does the sentence really "create a detailed image"? Does it mention any specific visual features of the landscape? The *next* sentence does, but not this one. So let's rule out A, leaving us with C and D.

You might also feel that this sentence "makes an assertion that the next sentence expands on." But what would that assertion be? That the landscape reflected her mood? The next sentence does seem to elaborate on the details of the landscape...but there is no reference to her feelings. If the other three choices were awful, maybe we should choose this answer, but this one seems pretty poor. We have to read too much into it to make it work.

What about the final choice? Does the sentence "illustrate an idea that is introduced in the previous sentence?" Can you find a general idea in the previous sentence that is illustrated by this sentence? You might feel that the idea is expressed very vaguely or awkwardly (at least for a modern audience), but there is an idea there, and the underlined sentence does illustrate it. The previous sentence amounts to "the surroundings reflected her inner feelings," or something like that. And the underlined sentence does elaborate or "illustrate" that idea. So D is a more reasonable answer than C.

Problem 7

Official Answer: B

The underlined sentence and the answer choices are all unusually long. This one may take a little work. Let's skim the passage, trying to simplify the dense prose as we go, and then go through the answer choices. In a nutshell, the first (underlined) sentence states that some European governments have recently become unpopular for cutting spending, despite some studies that say it shouldn't matter. Then the rest of the paragraph tries to explain this apparent contradiction.

A — We might say that the underlined sentence *introduces* the discrepancy, and the *rest of the paragraph* explains it, but the sentence in question does not constitute an explanation.

B — Yes, it identifies a "conflict" or apparent contradiction, and the subsequent text goes on to provide an explanation.

C — The divergence is not long-standing. The text states that the European governments suffered *recently*.

D — The first part of this answer is ok, but the second part isn't. The researchers attributed the discrepancy to governments trying to disguise their actions, not to failings on the part of the researchers themselves.

Problem 8

Official Answer: D

The answer choices are all very long, but the paragraph isn't that bad. Let's start by trying to summarize the paragraph in simple language. In a nutshell, we could say this: Adam Smith is famous for the metaphor of the "invisible hand", but he didn't actually use it much. It only became prominent later, when some modern economists made a big deal out of it.

Now, let's try to wade through the answer choices, looking for disqualifiers and easy ways to rule them out. Answer A looks pretty good, at least until the end. If we go back to the paragraph and double-check the reason that economists popularized the metaphor, we find that they were "eager to secure an intellectual pedigree for their views", which doesn't agree with "came to realize that the metaphor was a robust model". The paragraph says that they had ulterior motives, not that they actually believed in the value of the metaphor.

Answer B is a little easier to rule out. Again, the first half looks good, but the paragraph never explicitly discussed whether or not the metaphor was actually valuable, it only discussed what people did with it. Answer C focuses entirely on the details of the metaphor itself, and completely ignores whether or not it was popular or why.

Answer D is correct all the way to the end. Like A and B, it starts out by pointing out the discrepancy between the modern fame and the actual significance in Smith's original work, but it continues to correctly attribute the inflation to the ulterior motives of the modern economists.

Problem 9

Official Answer: A

What claim do we need to illustrate? That the poet deeply understands the reader. "Your true soul appears before me" can be considered as a metaphorical way of saying "I understand your soul" or "I understand you", so answer A achieves our goal.

Answers B and D include the words "whoever you are", which doesn't indicate deep understanding. Answers B and C refer to things the author is doing, or should have done, not to things the author understands. The part in answer D that says "I fear you are doing something" might be a foggy way of expressing a bit of understanding about the listener, but it's hardly *deep* understanding.

Problem 10

Official Answer: C

The answer choices don't contain numbers, and the table isn't the easiest in the world to read, especially considering the very sloppily labeled units. So it is difficult to fact-check the answer choices against the table. We'll have to do this one the long way.

What's the hypothesis that we need to support? That Arctic ground squirrels would sleep longer and say awake for shorter times than Alaska marmots. This is very easy to check. A glance at the second row in the table shows that the squirrels slept longer, and a glance at the fourth row in the table shows that they stayed awake less. The correct answer should refer to this fact, and answer C does.

This one is classified as "hard", perhaps because they didn't clearly indicate the units in the first and third rows, but all you really have to do is use two rows (the second and fourth, fortunately) in a table to fact-check a prediction.

Problem 11

Official Answer: C

What's the hypothesis? The plants need more than just room for their roots to grow, they actually need to digest minerals from the rock. Do any of the answer choices support this hypothesis?

A — This has nothing to do with acids or digesting minerals, and it brings in other species, which weren't part of the discussion.

B — We don't care how the composition of digestive juices varies among plants.

C — If the plants only needed room for their roots, and cracks are already available, then why would they go to the trouble of making their own cracks? Perhaps because they are doing something else besides merely making room for their roots? This observation would give support to the idea that the plants need to digest minerals from the rocks.

D — This *weakens* the hypothesis. If the plants thrive without phosphates, this implies that they don't really need to digest phosphates from the rocks after all.

Problem 12

Official Answer: A

We are making a comparison. We are trying to show that the rates of change have been very different. We need to find two dates, i.e. two rows in the table, that show the greatest disparity between the two countries. Which of the two rows in the table show the greatest disparity?

If we look at Agriculture in both countries, we might notice that both France and the US start at nearly the same level, and both countries end at nearly the same level. The same is true of manufacturing and of services. If we are trying to illustrate differences between the two countries, we can't compare 1800 with 2012, because the total change over that interval is pretty similar in both countries. We'll have to cherry-pick dates in between if we want to illustrate fluctuations in the rates. (But we can at least rule out answer B now, since that one compares 1800 with 2012.)

Let's go back to the table, looking for differences in numbers in the same sector and the same year. (It would help if we could color-code the table, highlighting both Agriculture columns in blue, and so on. Perhaps you can just imagine highlighting the column pairs one-by-one in your own head.) If you look at the agriculture columns, you might notice that the only significant difference between the two countries occurred in 1950 (32 *vs.* 14). Manufacturing was pretty similar in every year. The Services sector is like Agriculture: the only significant difference was in 1950 (35 *vs.* 53). So 1950 had better be one of our two comparison years. The other could be any of the other three years, but you'll notice that only one answer choice contains 1950.

Problem 13

Official Answer: C

If you don't want to wade through the jargon, you might notice that *A. thaliana* and ELF3 both appear in the paragraph, and while *A. thaliana* appears in all four answer choices, ELF3 only appears in two of them. So you could start by guessing that either B or C is probably correct.

To confirm, and to distinguish between the two remaining choices, we'll have to dive into the mess. Try to "dumb down", or at least encapsulate, what's going on. What's the gist of the research? Some plants flower faster when it's warmer, and some scientists removed the ELF chemical from these plants to see if the ELF was responsible. And the altered plants no longer flowered faster when it was warmer. So what's the natural conclusion? That ELF is what makes the plants flower faster? Answer C doesn't refer specifically to flowering, but we can assume that's implied by the context, and otherwise answer C says exactly what we need it to.

Problem 14

Official Answer: C

If the sweet potato (or one variety of it) has been in Polynesia for 100,000 years, but people have only been there for a few thousand years, what would you conclude? That people had nothing to do with it? Isn't that basically what answer C states?

Problem 15

Official Answer: A

There are lots of verbs and verb-like words in this sentence. But most of them are descriptors and modifiers. Can you find the actual subject and verb of this sentence? The spine of the sentence is this: "His energetic gestures and his habit of chasing balls helped transform the role." Choosing any answer except A fills the sentence with descriptors and modifiers and omits any actual verb. Only answer A tells us what his gestures and his habit actually did.

Problem 16

Official Answer: C

Here we have another example of the "profession Proper Name" pattern. It's quite common, and the name is almost always essential to specify the true subject of the sentence and should not be set apart by commas. If you are in a hurry, just guess the answer with no commas.

When we are talking about a specific individual, as we are in this case, the individual's name is essential, and it should definitely not be separated from the profession. The only question is whether we need a comma after the name for a different reason. In this case, the name "Lee" is immediately followed by the verb of the sentence "showed", and you should never separate a subject from its verb. That's a flagrant comma fault. So, as it often is, the answer with no commas is correct.

Problem 17

Official Answer: C

It might help to notice that every answer choice ends in "highly prized". Three of them have an additional verb in one tense or another, and one has no additional verb. That may make you suspect that the one with no verb is the correct answer. It also means that you could put "highly prized" back into the permanent paragraph, and just try reading "are", "had been", (nothing), and "were" in the blank.

If they had put a period after "artistry" and started a new sentence with "Its", then answer D would be appropriate. The verb phrase "were highly prized" would supply the predicate for a separate sentence. But they put a *comma* after "artistry", and we can't create a second independent clause after a comma. That would create a comma splice. Answers A, B, and D all create a second independent clause and a comma splice. (Answers A and B are also in the wrong tense.) Only answer C avoids creating a second independent clause. It makes the stuff after the comma into a participial phrase, i.e.

a descriptive adjective phrase instead of an actual independent clause, and a participial phrase is appropriate after a comma.

Problem 18

Official Answer: C

It often happens in the "Standard English" section of the test that you'll see several "however"s with a mixture of commas and semicolons sprinkled around. Always start by checking for independent clauses. You'll usually find an independent clause on each side of the blank, ruling out the commas and ruling in the semicolons. After you've confirmed that you need a semicolon, you can move on to the question of whether the "however" should come before or after the semicolon.

In this case, "they were not the first" and "some of them were also influenced by classics" are both independent clauses, so we do in fact need a semicolon.

Now for the placement of "however". If the contrast were between the two clauses on each side of the semicolon, the "however" would need to go with the second clause, after the semicolon. However, the contrast in this case is actually between the first clause and the *previous sentence*, so the "however" needs to go with the first clause, before the semicolon.

Problem 19

Official Answer: C

This has exactly the same pattern as the previous question. There are two independent clauses, thus necessitating the semicolon, and the contrast is between the first clause and the previous sentence, so the "though" needs to go with the first clause, i.e. before the semicolon. Even the letter of the answer choice is the same.

Problem 20

Official Answer: A

This one is classified as "hard", but it's downright simple if you see the trick. Try reading the four verbs with the subjects "it" or "they" and you'll notice that there are three plural verbs and one singular.

It is...
They were...
They have been...
They are...

If you want to confirm that the sole singular verb is correct, find the subject that needs to be paired with this verb. (This is what makes it "hard".) What is it that is autonomous? Each of the couplets. There are multiple couplets, but "each" means we are thinking of them one at a time. They even said "each *one*", making it clear that we need a singular verb. "Each one of them *is* autonomous."

Problem 21

Official Answer: A

How are the two sentences related? The second one is a contrast. She was in Paris ... but she wanted to go back to India. The only contrasting transition that we are offered is A. The usage may seem a bit awkward or old-fashioned to some ears, but "still" is still a perfectly valid contrasting word, and none of the other words are any good at all for introducing a contrast.

Problem 22

Official Answer: D

How are the two sentences related? The second one seems like a continuation or amplification of the first. The first mentions changing circumstances in the mathematical world, and the second seems to refer to the same thing. Let's check the answer choices, and see if we can rule any out.

"Similar" isn't really appropriate, because we aren't referring to two similar yet separate things. We are referring to the same thing. "For this reason" isn't appropriate, because the second isn't an effect or a consequence of the first. "Furthermore" might be tempting, but it probably seems a little awkward. The second sentence isn't providing further support for a claim that needs reinforcement.

That just leaves "increasingly". "Increasingly" is not technically a conjunctive adverb like the others, and it doesn't relate two sentences. It is just a normal adverb. But the previous sentence mentions "a shift in the opposite direction", so a word in the second sentence that indicates a trend of some kind is completely appropriate.

Problem 23

Official Answer: C

The first sentence indicates how the prime meridian was *originally* determined, and the second sentence

describes what happened after that. This is a temporal relationship, and only answer C involves time. The phrase "again and again" is working more like a normal adverb than a conjunctive adverb or other relational word. It's more of a stylistic "transition" than a "logical transition", which is what they sloppily asked for, but it's the only answer choice that works. The second sentence is not a specification of a general claim, it isn't describing an attempt to achieve a previously-mentioned goal, and it isn't indicating a qualification or contrast.

Problem 24

Official Answer: D

What's the goal? To explain how pineapple extract made fish grow faster. (There's only one species in this question, so let's just call them "fish".) If you jump to the answer choices at this point, you might be able to rule out one or two of them for not providing a clear "explanation" of how it works, but the correct answer isn't immediately obvious.

A — This says they grew faster, but it doesn't say why.

B — This looks great...at least at first glance.

C — This doesn't mention the extract or the enzyme at all. It's not an explanation of how a substance made the fish grow faster.

D — This looks pretty good, too.

So we can rule out A and C, but to distinguish between the other two, we'll need more information. Let's go to the bullet points to find out how the extract makes fish grow faster. From the second and third bullet points, we learn that the extract didn't make the fish eat more, but it did make them use the food they did eat more efficiently. The fourth bullet point confirms that this efficiency is what made the fish grow faster, and the last two bullet points elaborate.

Now, if we give B and D a closer inspection, we see that in answer B they did something sneaky. They pulled a switcheroo. The first three lines look great, but at the very end they say that the fish ate more, not that they used the food more efficiently, and this contradicts the information given in the bullet points. Answer B says the enzyme affected the fish's total food consumption, and the third bullet point explicitly says that the extract did *not* affect the fish's total food consumption.

Answer D also has a flaw. It doesn't refer to pineapples or to extract. It refers to the enzyme. The prompt asked us to explain how *pineapple extract* made the fish grow faster. However, the fifth bullet point tells us that the extract contains the enzyme, so it seems reasonable to take this as a given from the context, and explaining how the *enzyme* makes fish grow faster seems ok. In any case, none of the other answers can be correct, so we'll have to choose D.

Problem 25

Official Answer: B

What's the goal? To explain an advantage of microprobes. Looking for advantages in the notes, we find them in the fourth bullet point. We see that they are lightweight, and that they could be deployed anywhere, so the correct answer will probably mention these things.

You probably ruled out answer A right away. It doesn't mention microprobes at all. Answers C and D are almost as easy to rule out, because they don't mention any advantages. That only leaves answer B, which mentions both the light weight of microprobes and the fact that they can go where rovers can't.

Problem 26

Official Answer: B

What's the goal? To emphasize the study's methodology. The answer choice needs to place the method or procedure front and center. Not motivation, not results, just method. Scanning the notes for information about the method, we find it in the third bullet point: They reviewed 132 websites and studied the policies that were published there.

Answer choice A mentions the 132 schools, but it doesn't say that anybody did anything with them. This doesn't qualify as "emphasizing the methodology". Answer C is all about results, and answer D is all about motivation. Answer B gives both the motivation and the method, so we could quibble about whether this really counts as *emphasizing the methodology*, but it's the only answer choice that even mentions the method, which makes it the best of the four choices.

Problem 27

Official Answer: D

What's the goal? To make a generalization about the nature of the study. So answers with facts and figures in them are likely to be wrong. We are looking for a broad

statement about what kind of study this is. What kind of study is it? Scanning the bullet points, we find the answer in the fourth bullet point. It "used statistical methods". That may not seem like a lot, but it's all we have to go on, and the correct answer will probably mention it. Now, look over the four choices.

Answers A-C all involve specific facts, figures, and names. Answer B even includes a percentage expressed to three significant figures. Only answer D omits specifics, and it mentions "statistical methods", so that must be the correct answer.

Problem 1

Official Answer: C

Defects:	29
Total:	100
Fraction:	$\frac{29}{100}$

Problem 2

Official Answer: D

This is a simple substitution and evaluation problem. The formula gives us $s(t)$, and we want $s(5)$, so we simply have to substitute:

$$s(5) = 40 + 3(5) = 40 + 15 = 55$$

Problem 3

Official Answer: C

Just multiply the entire equation by 6.

$$4x = 3$$
$$24x = 18$$

Problem 4

Official Answer: A

When they give you a linear graph and ask for the corresponding equation, always start with a simple sign check. In this case, we need a positive slope and a positive y-intercept, and answers B-D all contain negatives.

Problem 5

Official Answer: D

The answer choices are not close together, and you can probably estimate the answer in your head: 200 out of 300 would be two-thirds, or $66.\bar{6}\%$. The true percentage must be significantly larger than this, which leaves only answer D.

On the other hand, it would take only a few seconds to calculate the exact value in a calculator:

$$\frac{234}{300} = 0.78 = 78\% \text{ exactly.}$$

Problem 6

Official Answer: D

Start with what's easiest. The first row in the table has $x = 0$, meaning it gives the y-intercept, so we can rule out any answer choices that don't have 18 as the y-intercept. This narrows our choices to B and D.

To calculate the slope, we can just use the first and second rows in the table. They give a fall of 5 over a run of 1, meaning the slope is -5, and the correct answer is D.

Problem 7

Official Answer: 77

$$\begin{aligned} f(x) &= x^2 + x + 71 \\ f(2) &= 2^2 + 2 + 71 \\ &= 4 + 2 + 71 \\ &= 77 \end{aligned}$$

Problem 8

Official Answer: B

They give us a mess and four simpler answer choices. Just follow your instincts, try to simplify the mess, and hope that this gives you one of the four answer choices.

Since we have a product of products, and we can rearrange the factors within a product however we like, we can just remove the parentheses and combine factors. Remembering exponent rules for products (you can combine the same base raised to two different powers by adding the powers), we can combine thusly:

$$\begin{aligned} (m^4q^4z^{-1})(mq^5z^3) &= m^4mq^4q^5z^{-1}z^3 \\ &= m^{4+1}q^{4+5}z^{-1+3} \\ &= m^5q^9z^2 \end{aligned}$$

You can ignore the statement that m, q, and z are positive. Like domain restrictions on functions, they are merely trying to spare you from having to worry about division by zero.

Problem 9

Official Answer: D

If two corresponding sides are 850 and 60, then the scale factor must be 85/6. Triangle ABC is 85/6 times as

large as triangle XYZ. So if AB is 170, then XY must be $6/85^{\text{ths}}$ of 170, or 12.

You could also just set this up as a proportion problem:

$$\frac{XY}{AB} = \frac{YZ}{BC}$$
$$\frac{XY}{170} = \frac{60}{850}$$
$$XY = 170 \cdot \frac{60}{850} = 12$$

Problem 10

Official Answer: 24

You can simply substitute 4 for the ratio x/y and then solve for n:

$$\frac{24x}{ny} = \frac{24}{n} \cdot \frac{x}{y} = \frac{24}{n} \cdot 4 = 4$$
$$n = 24$$

Problem 11

Official Answer: D

$$\begin{aligned} \text{Volume Remaining} &= \text{Starting Volume - Rate}\cdot\text{Time} \\ w(t) &= 300 - 4t \end{aligned}$$

The container apparently started with 300 milliliters of liquid, and it is losing liquid at a rate of 4 milliliters per second.

Problem 12

Official Answer: C

You may recognize the characteristic behavior of a cubic polynomial in the graph, or you might read the problem and see the cubic polynomial, and you might think "Oh lord! I have to deal with a cubic polynomial?" But the complexity and the form of the curve really don't matter. All you need to do is to count the zeros of the function. The function $f(x)$ equals zero whenever the graph of $f(x)$ crosses the x-axis, so just count how many times the given curve crosses the x-axis. It crosses three times (at x=-1, 4, and 7, but the values don't matter), so the correct answer is 3.

Problem 13

Official Answer: D

The coefficient of an exponential function represents the initial value or starting point. Since this function measures population after 2008 and contains a coefficient of 3000, this means that the population in 2008 was 3000.

Problem 14

Official Answer: 7

You could complete the square, thus transforming the expression into "vertex form" and giving

$$y = (x-7)^2 - 27$$

for which the vertex is located at (7,27), and thus the minimum value of 27 occurs at $x = 7$. If you know calculus, you could also take the derivative and set it equal to zero, giving $2x - 14 = 0$ and $x = 7$.

But they are probably expecting you to remember the "vertex formula". If you don't, you should review it, because it is often helpful on the SAT. Given a quadratic expression, the x-coordinate of the vertex, and of the axis of symmetry, and of the minimum or maximum value, can be found simply by plugging the coefficients into the formula $x = -b/2a$. For the given expression, this results in $x = -(-14)/2(1) = +7$.

Problem 15

Official Answer: 27556

In other words, what's the ratio of areas? How many times bigger is A than B?

If the sides have a ratio of 166, then the areas have a ratio of $166^2 = 27{,}556$.

Problem 16

Official Answer: 25

You'll notice that the a term is identical in both equations, so this is easy to solve by subtracting the second equation from the first:

$$\begin{aligned} 2a + 8b &= 198 \\ 2a + 4b &= 98 \\ \hline 8b - 4b &= 198 - 98 \\ 4b &= 100 \\ b &= 25 \end{aligned}$$

Problem 17

Official Answer: A

The y-intercept lies on the y-axis, where $x = 0$, so just substitute $x = 0$ into the given formula. This produces $-8(2)^0 + 22 = 8 + 22 = 14$, making A the correct answer.

Problem 18

Official Answer: D

Notice that all four answer choices are exponential functions, which represent continuous growth by a constant scale factor. The coefficient of an exponential function always represents the starting value. Since they tell us that $y = 200$ when $x = 0$ (i.e. at the beginning), the coefficient must be 200. This rules out A and B. The base always represents the growth factor. Since they tell us that the value of y increases by a factor of 4, the base must equal 4, which rules out everything except answer D.

Problem 19

Official Answer: A

You can just plug this into your calculator (making sure it is radian mode): $\sin 42\pi = 0$.

However, this is pretty easy to do in your head, without a calculator (notwithstanding the fact that this is classified as "hard" by the College Board). 42π is a multiple of 2π, meaning that we have gone around the circle 21 times and come back to the starting point. An angle of 42π is the same as an angle of 0, and the sine of zero is zero.

Problem 20

Official Answer: D

Rewriting both equations in slope-intercept form gives

$$y = \frac{4}{18}x - \frac{5}{18}$$
$$y = \frac{4}{h}x + \frac{2}{18}$$

For the two equations to have so solution, the lines must be parallel, meaning that the slope coefficients must be equal, meaning $h = 18$.

You could also rewrite both equations into standard form and then match coefficients:

$$4x - 18y = 5$$
$$4x - hy = -2$$

Making $h = 18$ will guarantee that the lines are parallel, and the different constants guarantee that the lines will have different y-intercepts, so that the system will thus have no solutions instead of than "infinitely many" solutions.

Problem 21

Official Answer: B

This is one of the rare examples of a quadratic expression on the SAT that isn't factorable. But this makes sense, since they want us to deal with radicals in the solutions. Let's go ahead and apply the quadratic formula and see where it takes us. Plugging $a = 1$, $b = -2$, and $c = -9$ into the quadratic formula gives this:

$$x = \frac{-b \pm \sqrt{b^2 - 4ac}}{2a} = \frac{2 \pm \sqrt{4 - 4(-9)}}{2} = 1 \pm \sqrt{10}$$

Picking the positive answer, and matching it against $1 + \sqrt{k}$, we see that k has to equal 10.

You could also substitute the expression $1 + \sqrt{k}$ into the equation and see what happens:

$$\begin{aligned} x^2 - 2x - 9 &= 0 \\ (1 + \sqrt{k})^2 - 2(1 + \sqrt{k}) - 9 &= 0 \\ 1 + 2\sqrt{k} + k - 2 - 2\sqrt{k} - 9 &= 0 \\ k &= 9 + 2 - 1 \\ &= 10 \end{aligned}$$

Problem 22

Official Answer: D

Trial-and-error is out of the question, unless you are prepared for a half-hour of scribbling. We could try substituting $-c$ for x, and quickly discover that this leads to a divide-by-zero problem, so we can rule out A. But substituting the other expressions is going to be too much work.

We'll have to try to rewrite the equation into a form that we can solve. How much work this will require will depend partly on your training and your instincts. If

your instinct is to clear the messy denominators first, your calculations should look something like this:

$$\frac{x^2}{\sqrt{x^2-c^2}} = \frac{c^2}{\sqrt{x^2-c^2}} + 39$$
$$x^2 = c^2 + 39\sqrt{x^2-c^2}$$

Now let's try isolating the square root so that we can remove it by squaring.

$$\frac{x^2-c^2}{39} = \sqrt{x^2-c^2}$$
$$\frac{(x^2-c^2)^2}{39^2} = x^2-c^2$$

We've already ruled out the possibility that $x = c$, which would make $x^2 - c^2 = 0$, so we are allowed to divide the equation by the factor $(x^2 - c^2)$.

$$\frac{(x^2-c^2)^2}{39^2} = x^2-c^2$$
$$\frac{x^2-c^2}{39^2} = 1$$
$$x^2-c^2 = 39^2$$
$$x^2 = 39^2 + c^2$$
$$x = \pm\sqrt{39^2+c^2}$$

The only answer choice that matches either of these two possibilities is answer D.

On the other hand, if you notice that both fractions have the same denominator, and your instinct is to move both terms to the same side of the equation and combine like terms, your calculations should look something like this:

$$\frac{x^2}{\sqrt{x^2-c^2}} = \frac{c^2}{\sqrt{x^2-c^2}} + 39$$
$$\frac{x^2}{\sqrt{x^2-c^2}} - \frac{c^2}{\sqrt{x^2-c^2}} = 39$$
$$\frac{x^2-c^2}{\sqrt{x^2-c^2}} = 39$$
$$\sqrt{x^2-c^2} = 39$$
$$x^2-c^2 = 39^2$$
$$x^2 = 39^2 + c^2$$
$$x = \pm\sqrt{39^2+c^2}$$

Problem 1

Official Answer: 40

Subtracting 5 from both sides of the equation gives $4x = 160$, then dividing both sides by 4 gives $x = 40$.

Problem 2

Official Answer: C

$$365 - 130 = 235$$

Problem 3

Official Answer: A

This is classified as an "inequality" problem, but it's really just an elementary school subtraction problem. If she has 86, and she needs 100, then she needs 100-86=14 more than she already has.

Problem 4

Official Answer: C

Just read the coordinates of the intersection. It lies at (-4,-3).

Problem 5

Official Answer: 39000

If there are 1000 grams in every kilogram, there must be 39,000 grams in 39 kilograms.

Problem 6

Official Answer: 2

$$f(x) = 4x$$
$$8 = 4x$$
$$x = 8/4 = 2$$

Problem 7

Official Answer: B

A corresponds to D, so $D = A = 18°$. Since F and D are the acute angles in a right triangle, they must be complementary. So $F = 90 - 18 = 72$.

Problem 8

Official Answer: D

Imagine sliding the two parallel lines together, using line t as a rail, while keeping them parallel. None of the angles would change, and you can see that x and 33 are supplementary angles, meaning they add up to a straight angle. So $x = 180 - 33 = 147$.

Problem 9

Official Answer: B

This is a "solve the system" problem. As with many systems of equations on the SAT, especially if they are near the beginning of the test, this one is pretty easy. Notice that the two x terms are equal and opposite. We only care about y, meaning we can just add the two equations together and the solution for y will appear almost instantly.

$$3x - 3x + y = 12 - 6$$
$$y = 6$$

Problem 10

Official Answer: A

They give us a polynomial and ask us for an equivalent expression. The answer choices all consist of a product of a monomial and a binomial, so we are clearly supposed to factor out common factors. In the expression $9x^2+5x$, x is the only common factor, and what remains after dividing all terms by x is $9x + 5$. So $9x^2 + 5x$ in factored form is $x(9x + 5)$.

If factoring bothers you, you could also just apply the distributive property to each of the answer choices and see which one gives you $9x^2 + 5x$.

Problem 11

Official Answer: A

Just keep the numbers straight. They've even helpfully named his walking hours w and his running hours r. So the number of hours walking (w) multiplied by the number of miles per hour when walking (3) gives the number of miles walked ($3w$), and the number of hours running (r) multiplied by the number of miles per hour when running (5) gives the number of miles covered while running ($5r$). And adding these two together ($3w+5r$) gives his total distance covered, which we are told is 14 miles.

So translating all of that into a compact mathematical sentence, we have $3w + 5r = 14$.

Problem 12

Official Answer: D

Adding up all four sides gives $4+4+9+9 = 2\cdot4+2\cdot9 = 26$.

Problem 13

Official Answer: D

If you are familiar with the slope-intercept form of an equation, and you recognize that (0,14) is the y-intercept, this should be child's play. Just plug in 1/9 for m and 14 for b to give $y = \frac{1}{9}x + 14$.

Problem 14

Official Answer: D

When you see a right triangle with the sides labeled a, b, and c, you should automatically think of the Pythagorean Theorem. If you remember the Pythagorean Theorem, this one should be a cakewalk. (If you don't, it's on the reference page.) Only one answer choice has the right pattern. They haven't even bothered to change the names of the variables.

So, given that $c^2 = a^2 + b^2$, or $c = \sqrt{a^2 + b^2}$, and given that $a = 4$ and $b = 5$, then

$$c = \sqrt{4^2 + 5^2}$$

.

Problem 15

Official Answer: 41

There are a few different ways you could think about this. The simplest way is probably just to reason it through: If she bought 10 packages of party hats at \$3 each, then she must have spent \$30 on party hats, leaving \$71-\$30 or \$41 for the cupcakes. If each cupcake cost \$1, and she spent \$41 on them, then she must have bought 41 cupcakes.

If you are highly drilled in algebra, your instincts may lead you to set this up as an algebra problem, which would work just as well:

$$\begin{aligned} 3 \cdot 10 + 1 \cdot x &= 71 \\ x &= 71 - 30 = 41 \end{aligned}$$

Algebra is, after all, just a formal system for reasoning with calculations using symbols.

Problem 16

Official Answer: D

Are you even tempted by A or B?

If you've been following along at all in your math classes, and assuming you had a half-way decent instructor, you know that shifting graphs of functions up or down involves merely adding or subtracting the shift value to the function, effectively sliding the graph up or down and changing the "height". So if we start with $7x^3$ and we want to shift it down by 2 units, we simply subtract 2, and we obtain $7x^3 - 2$.

Problem 17

Official Answer: A

You probably noticed right away the similarity in both equations. They both contain $x + 7$. So you can substitute the first equation directly into the second and find that $y = (x + 7)^2 = 10^2 = 100$. Only answer choice A has $y = 100$.

If you didn't catch this shortcut, perhaps you noticed that all four answer choices have $x = 3$, so that must be the correct x-value, and you can just substitute $x = 3$ into the second equation to obtain $(3 + 7)^2 = y$ and $y = 100$.

If you didn't notice either of these things, you could still solve the first equation for x ($x = 10 - 7 = 3$), and then substitute this into the second equation to find y ($y = (3 + 7)^2 = 10^2 = 100$).

Problem 18

Official Answer: D

Notice that all four answer choices are exponential functions, which represent continuous growth by a constant scale factor. The coefficient of an exponential function always represents the starting value. Since they tell us that $y = 200$ when $x = 0$ (i.e. at the beginning), the coefficient must be 200. This rules out A and B. The base always represents the growth factor. Since they tell us that the value of y increases by a factor of 4, the base must equal 4, which rules out everything except answer D.

Problem 19

Official Answer: B

Linear systems with no solution involve two linear equations with the same proportionality constant, but different offsets. If you think of it graphically, you need two parallel lines, with the same slope but different y-intercepts. So the second equation in this system must have the same slope (6), but a different y-intercept (something other than 18).

All four answer choices are in "standard form" instead of the more familiar "slope-intercept form", but it hardly matters. Just add $6x$ or $12x$ to both sides of the equation, effectively moving the x-term over to the other side, which you may be able to do in your head, and now you have the equation in slope-intercept form. If you'd like to use a pencil to record your changes and help avoid mistakes, the rewritten equations should look like this:

A) $y = 6x + 18$
B) $y = 6x + 22$
C) $y = 12x + 36$
D) $y = 12x + 18$

Answer choices C and D have the wrong slope. Answer choice A would be correct if the system had an *infinite* number of solutions. Answer choice A has both the same slope and the same y-intercept, and is therefore an equivalent equation. This leaves only answer choice B. That's the only choice with the same slope by a different y-intercept.

Problem 20

Official Answer: D

The x-intercept is the place where $y = 0$, so just set the function equal to zero and then solve for x.

$$\begin{aligned} y = f(x) &= 7x - 84 \\ 0 &= 7x - 84 \\ x &= 84/7 = 12 \end{aligned}$$

Problem 21

Official Answer: 11875

If $g(x) = 19 \cdot a^x$, and $g(3) = 2375$, then 2375 must be what you get when you multiply 19 by a three times. This means that $a^3 = 2375/19 = 125$, and $a = \sqrt[3]{125} = 5$. To find $g(4)$, we can simply start from 2375 and multiply by 5 one more time, giving 11,875.

In symbols:

$$\begin{aligned} g(3) &= 19a^3 = 2375 \\ a^3 &= 2375/19 = 125 \\ a &= \sqrt[3]{125} = 5 \\ g(4) &= 19(5)^4 = 19 \cdot 625 = 11,875 \end{aligned}$$

If you wanted to be fancy, you could notice that going from $g(3) = 2375$ to $g(4)$ means multiplying by $(2375/19)^{4/3} = 625$, and $19 \cdot 625 = 11,875$.

(Note that the digital answer box only has space for 5 characters, so you'll have to ignore the comma when entering your answer.)

Problem 22

Official Answer: C

You need to convert the percent to a decimal and add 1, giving 1.07.

Fuller explanation: A 7% change means that the *amount of the change* is 0.07 times the original amount. But with percentage problems, you always need to pay attention to whether you are discussing the *amount of the change itself*, or the *new total after the change*. In this problem, we need to express the growth as a multiplication factor ("the 2016 population is k times the 2015 population"), so we need to worry about the final total after the change. This means we need to add 100% or a factor of 1 to account for the original amount. A 7% growth results in a new value that is 1.07 times the original. The 1 accounts for original amount, and the .07 accounts for the increase.

Problem 1

Official Answer: B

"Constant rate" means linear, and the airplane is descending, so the best "model" is a decreasing linear function.

Problem 2

Official Answer: B

This one is classified as "medium" difficulty, but you don't need to do anything other than read a coefficient in an equation. The slope of a line corresponds to the coefficient of the linear equation, and parallel lines have the same slope, so the answer is just $\frac{17}{7}$.

Problem 3

Official Answer: C

$$f(x) = -5x + 30$$
$$\text{Volume} = -5 \cdot \text{Number of Popsicles} + 30$$

The y-intercept of a graph typically represents a constant offset or starting value of some kind. The function in this case represents the consumption of juice, and the starting value is the volume of the initial supply of juice. So our "interpretation" is "Caleb started with 30 ounces of juice". Answer A correctly interprets the "5", but that's not what they asked for.

Problem 4

Official Answer: B

The parabola must be downward-facing, both because the coefficient in the equation is negative, and because a toy rocket can't fall upwards. The vertex of a downward-facing parabola represents the peak or maximum value, and since the equation is given in vertex form, we can see from the coefficients that this happens at (5.6, 502). Thus we conclude that at 5.6 seconds, the rocket reached a maximum height of 502 feet.

Problem 5

Official Answer: 67

$$\begin{aligned} f(x) &= 4x + k(x-1) \\ f(5) = 32 &= 4(5) + k(5-1) \\ 32 &= 20 + 4k \\ 4k &= 12 \\ k &= 3 \\ f(10) &= 4(10) + (3)(10-1) \\ &= 40 + 27 = 67 \end{aligned}$$

Problem 6

Official Answer: B

A corresponds to D, so $D = A = 18°$. Since F and D are the acute angles in a right triangle, they must be complementary. So $F = 90 - 18 = 72$.

Problem 7

Official Answer: D

Let's start with the middle two answers, because $x = 0$ for these two cases, and this makes our equations simplify to $y \leq 7$ and $y \geq -1$. Answer B fails to satisfy the second equation, and answer C fails to satisfy the first.

Checking the remaining two answer choices, we find that answer A fails to satisfy either equation, while D satisfies both of them.

Problem 8

Official Answer: A

You can easily find the median of both data sets from the information given. Just count how many data points there are in each set, then find the one in the middle. Or you can just notice that both sets are symmetric, with 13 in the middle. Therefore the medians of both sets are 13, and Statement I must be true.

Figuring out if statement II is true or not will be a little trickier, since it involves the standard deviation. If you are comfortable with the statistics mode in your calculator (or if you just happen to remember the definition of standard deviation, which nobody does), you could actually calculate the standard deviations of the two sets. But that wouldn't be the recommended way of going about it. Calculating standard deviations is laborious, and it is never necessary on the SAT. Just

remember that standard deviation is a measure of "dispersion" or "spread", and notice that the second data set seems a bit more "spread out" than the first. If you look closely, you may notice that data set B is identical to A, except that we have taken two dots from the center, and placed one at each of the ends, which indeed makes it more "spread out". So the standard deviation of the second set must be greater than that of the first set, and Statement II is false.

Statement I is true, Statement II is false, and A is the correct answer.

Problem 9

Official Answer: B

It took four hours to double. This means that the exponent rt must increase by 1 every four hours. Since t is measured in hours, we need to divide it by 4 to to make it count the number of four-hour intervals. Thus $r = 1/4$.

Problem 10

Official Answer: 36504

You can find the side length by taking the cube root of the volume, and then you can square this to find the area of one side. Or, since you got out your calculator anyway, you could just raise 474,552 to the 2/3 power. Either way, you get 6084.

Since the cube has six faces, we need to multiply the area of one face by 6 to find the total surface area of the cube, giving 36,504.

You'll have to ignore the comma when entering your answer, since there is only room for 5 characters in the answer box.

Problem 11

Official Answer: 3

This is classified as "hard", but if you can think of "$8x$" and "$7y$" as their own quantities, this is not too difficult. If it helps, you could explicitly name these quantities, perhaps $u = 8x$ and $v = 7y$.

There is no way to manipulate the equations to obtain an expression for $8x + 7y$ directly, so we'll have to solve for the two quantities individually. Let's go ahead and do a formal "variable substitution", naming $u = 8x$ and $v = 7y$, in which case the problem becomes this:

$$2u + 4v = 12$$
$$-2u + 4v = 12$$

What is the value of $u + v$?

Adding the two equations gives $8v = 24$ and $v = 3$. Subtracting gives $4u = 0$ and $u = 0$, so the sum is $u + v = 3 + 0 = 3$.

Problem 12

Official Answer: D

Answer B is a very easy trap to fall into. You have a small number, you need to convert it to a bigger number, and they give you the conversion factor, so you multiply 4.36 by 1760 and obtain 7674, which is answer B. But that's the trap answer.

The SAT includes unit conversion questions fairly often, and most of the time, you would not be led astray if you followed this procedure. But the sneaky thing here is that you need to convert an *area* using a *linear conversion factor*.

How many inches are in a foot? You probably answered twelve. How many *square* inches are in a *square* foot? If you are not sure, try drawing a square, then subdivide all sides into 12 pieces. You will probably see that there are not 12 square inches in a square foot, there are 144, or 12^2. Whenever you need to convert an area using a conversion factor for linear measurements, *you have to square the conversion factor*. (Or equivalently, you have to multiply by the conversion factor twice.) So for this town's area, in *square* yards, we have to multiply by 1760 *twice*, giving 13,505,536.

Problem 13

Official Answer: C

Try sketching triangle PQR. You'll probably notice that it's symmetric. There's a right angle, and the two legs are equal. It's an isosceles right triangle, otherwise known as a 45-45-90 right triangle. The measure of angle Q, a.k.a t, is therefore 45.

You might notice that triangle LMN is the same way. You could graph it by making up a number for k, but whatever the value of k, this must be another 45-45-90 right triangle, and the measure of angle N is therefore also 45.

They don't give 45 or t as answer choices, but they do give 90-t. If t is 45, then 90-t is also 45, making C the only correct choice.

You might also notice that three of the answer choices involve k, which is supposed to be a linear measurement. You can't add a linear measurement to an angular measurement, so none of these answers make any sense.

Problem 14

Official Answer: 182

Trial-and-error might work here, if you are clever at making and refining your guesses. But you might end up having to make very many guesses before you reach the right number. Systems of equations are fairly common on the SAT, so it would probably help to learn the formal way of solving problems like this.

You could choose x and y for your variables, but you don't want to risk getting confused about what stands for what. Why not choose s to stand for the number of small candles, and l to stand for the number of large candles? We know that the minimum number of candles is 200, so we can write $s + l \geq 200$ as our first equation. We know the maximum dollar amount is \$2200, so we can write $4.90s + 11.60l \leq 2200$ as our second equation. Solving this system is straightforward, if a bit tedious. Since we are only interested in the number of large candles, let's solve the first equation for s and then substitute that into the second equation, which should enable us to solve for l.

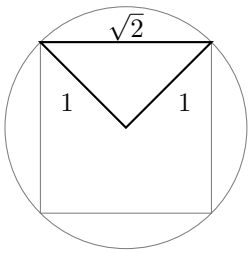
$$\begin{aligned} s &\geq 200 - l \\ 4.90(200 - l) + 11.60l &\leq 2200 \\ (11.60 - 4.90)l &\leq 2200 - 4.90(200) \\ 6.7l &\leq 1220 \\ l &\leq 182.09 \end{aligned}$$

We can't buy fractional candles, and 183 candles would put us overbudget, so the maximum number of large candles is 182.

Problem 15

Official Answer: A

If you recognize that one side of the square along with two radii form a 45-45-90 right triangle, this is relatively easy. The side length of the square is the same as the hypotenuse of a 45-45-90 right triangle having the circle's radius as the legs.



So the side of the square is simply $\sqrt{2}$ times the circle's radius:

$$\sqrt{2} \cdot \frac{20\sqrt{2}}{2} = 20$$

If you've forgotten the ratios of sides of a 45-45-90 right triangle, they're on the reference page. If you don't recognize that you are working with a 45-45-90 right triangle, you can still solve the problem using the Pythagorean Theorem. The two legs of the right triangle are $20\sqrt{2}/2$ and $20\sqrt{2}/2$, so the hypotenuse is

$$\begin{aligned} \sqrt{\left(\frac{20\sqrt{2}}{2}\right)^2 + \left(\frac{20\sqrt{2}}{2}\right)^2} &= \sqrt{2\left(\frac{20\sqrt{2}}{2}\right)^2} \\ &= \sqrt{\frac{1}{2}20^2(\sqrt{2})^2} \\ &= 20 \end{aligned}$$

Problem 16

Official Answer: C

All four answer choices give legitimate equations for different circles in the coordinate plane, and if you are familiar with equations of circles, you can read the radii and the coordinates of the centers directly from the equations. All of the circles have a radius of 4, and the first one has a center at (8,8). The second one has a center at (8,4), the third has a center at (4,9), and the fourth has a center at (0,9). Now, what do they ask for? The one which "intersects" the y-axis at exactly one point. More precisely, it "just touches" or is "tangent to" the y-axis. In other words, the circle is to the left or right of the y-axis, by an offset equal to the radius of the circle. In other words, the x-coordinate of the center must be equal (in absolute value) to the radius

of the circle. The only circle with an x-coordinate of 4 or -4 is answer choice C. (Answer B would be correct if they had asked for a circle tangent to the *horizontal* or x-axis. Answers A and D aren't tangent to either axis.)

Problem 17

Official Answer: B

Linear systems with no solution involve two linear equations with the same proportionality constant, but different offsets. If you think of it graphically, you need two parallel lines, with the same slope but different y-intercepts. So the second equation in this system must have the same slope (6), but a different y-intercept (something other than 18).

All four answer choices are in "standard form" instead of the more familiar "slope-intercept form", but it hardly matters. Just add $6x$ or $12x$ to both sides of the equation, effectively moving the x-term over to the other side, which you may be able to do in your head, and now you have the equation in slope-intercept form. If you'd like to use a pencil to record your changes and help avoid mistakes, the rewritten equations should look like this:

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Answer choices C and D have the wrong slope. Answer choice A would be correct if the system had an *infinite* number of solutions. Answer choice A has both the same slope and the same y-intercept, and is therefore an equivalent equation. This leaves only answer choice B. That's the only choice with the same slope by a different y-intercept.

Problem 18

Official Answer: C

This one is obnoxious. Besides being complicated and messy, you might notice that answer choices C and D are *not* in simplest form. They both have extra y's everywhere.

Let's start with what we are given. We have the sum of two fractions, and all answer choices contain a single fraction, so clearly we need to add the two fractions. This means that we need to find a common denominator. Let's start by factoring the denominator in the second fraction.

$$\frac{y+12}{x-8} + \frac{y(x-8)}{x^2y - 8xy}$$

$$\frac{y+12}{x-8} + \frac{y(x-8)}{xy(x-8)}$$

Now it's clear that we can make a common denominator by multiplying the first fraction by xy/xy. You might also be tempted to eliminate the common factor of y from the second fraction, and in real life that would definitely be the sane, healthy, and rational thing to do. But the SAT sometimes makes you do things that are not sane and rational. Given that answers C and D both have extra y's, perhaps we should leave the y where it is.

$$\frac{xy(y+12)}{xy(x-8)} + \frac{y(x-8)}{xy(x-8)}$$

$$\frac{xy(y+12) + y(x-8)}{xy(x-8)}$$

$$\frac{xy^2 + 12xy + yx - 8y}{x^2y - 8xy}$$

$$\frac{xy^2 + 13xy - 8y}{x^2y - 8xy}$$

So indeed, bloated answer C with the extra y's is the correct answer.

Problem 19

Official Answer: C

We need to isolate q. First of all, notice that we can divide the entire equation by 20 since all of the numerators are identical.

$$\frac{20}{p} = \frac{20}{q} - \frac{20}{r} - \frac{20}{s}$$

$$\frac{1}{p} = \frac{1}{q} - \frac{1}{r} - \frac{1}{s}$$

Now we can solve for $1/q$, flip (i.e. take the reciprocal of) both sides of the equation to obtain q, and then

multiply by prs/prs to clear the compound fraction.

$$\begin{aligned}\frac{1}{q} &= \frac{1}{p}+\frac{1}{r}+\frac{1}{s}\\ q &= \frac{1}{\frac{1}{p}+\frac{1}{r}+\frac{1}{s}}\\ &= \frac{prs}{rs+ps+pr}\end{aligned}$$

Problem 20

Official Answer: 50

If we expand and rearrange the equation, we can form a quadratic equation in standard form, and then we can apply the discriminant formula. Rearranging the equation into standard form gives this:

$$\begin{aligned}x(kx-56) &= -16\\ kx^2-56x+16 &= 0\end{aligned}$$

Since there is no (real) solution, the discriminant must be negative.

$$\begin{aligned}b^2-4ac &< 0\\ (-56)^2-4(k)(16) &< 0\\ 64k &> 56^2 = 3136\\ k &> \frac{3136}{64} = 49\end{aligned}$$

We are told that k is an integer, and the first integer that is greater than 49 is 50. (A value of $k = 49$ would make the discriminant exactly equal to zero, which would imply one solution, not no solutions.)

Problem 21

Official Answer: B

This one's another hot mess.

We're given a system of linear equations with relatively simple coefficients, and your natural instinct is probably to try to solve the system. If you try, you will soon discover that the two equations are equivalent, i.e. they represent the same relationship. The second equation is identical to the first equation multiplied by 5. This doesn't help us to answer the question, but it does at least allow us to eliminate a distraction. Since the two equations are equivalent, we can ignore one and focus our attention on the other. Let's focus on the first one because it has smaller coefficients.

So now the problem is that we have this equation, $2x+3y=7$, plus a list of messy coordinate pairs containing an unknown variable, and we need to figure out which coordinate pair always lies on the line, regardless of the value of the unknown variable. There isn't much that we can do here, other than to try plugging in each of the four pairs of coordinates for x and y, and seeing what we get. It's very annoying, but it really doesn't take that long. Just be sure you have plenty of room for scribbling on your scratch paper.

You might want to start with one of the latter coordinate pairs, because they seem like they might be simpler. But to illustrate, let's start with the first pair, and substitute $r/5+7$ for x into our equation, and $-r/5+35$ for y. Doing so gives this:

$$2\left(\frac{r}{5}+7\right)+3\left(\frac{-r}{5}+35\right)=7$$

Fractions are annoying, so let's multiply by 5 to clear the denominators.

$$\begin{aligned}2r+70-3r+\text{huge number} &= 35\\ r &= \text{huge number}\end{aligned}$$

We don't really care about the numbers; all we care about is the pattern. The equation $r =$number will be true for only one value of r. It will only be true if r actually equals this number. We want it to be true for *all* values of r, so this can't be the right answer.

Next, let's see what happens if we plug in the second coordinate pair.

$$2\left(\frac{-3r}{2}+\frac{7}{2}\right)+3(r)=7$$

Multiplying by 2 to clear the denominators, we find

$$\begin{aligned}-6r+14+6r &= 14\\ 14 &= 14\end{aligned}$$

This is true no matter what value r has. So we've found our answer. If you want to go ahead and try plugging in the last two coordinate pairs, you would find that, like the first one, they simplify to $r =$number, which is only true for one value of r.

Another strategy might be to notice that the last two answer choices have the form $(r, f(r))$. So we could solve the given equation for y and see if the expression matches $f(r)$. Solving $2x+3y=7$ for y yields $y = -2/3x+7/3$. This does not match the expression for y in either answer C or D, so we can rule those out. Next, we could notice that answer B has the form $(f(r), r)$, so

we could try solving the given equation for x. Solving $2x + 3y = 7$ for x gives $x = -3/2y + 7/2$. This *does* match the expression for x in answer B, so answer B must be correct.

Problem 22

Official Answer: A

Working backwards from the 5-hour total of $400, we see that the fee for the second three hours was 400-220 = 180, and thus the hourly rate was 180/3 = 60. At this point, we can rule out choices C and D, because they have the wrong rate.

But beware of choosing B. That one would be correct if x measured the time *after the third hour*. They have sneakily made x measure the number of hours *since the beginning*, but they have just disallowed values less than 2 when calculating the result. So if we choose B, we'll be double-counting the initial cost for the first two hours. The other answer must be correct.

If you want to confirm that answer A is correct, you could try plugging in $x = 2$. The formula needs to yield $220, because that's the fee for the first two hours. Answer A gives $220, but answer B does not.