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IOACT Practice Tests

Second Edition

- Model exams that gauge your test readiness
- Detailed explanations for every question
- Worksheets to calculate scaled test scores

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McGraw-Hill's 10 ACT Practice Tests

ABOUT THE AUTHOR

Steve Dulan has been involved with the ACT since 1982, when he received a score of 32 on his own test as a high school junior at Iron Mountain High School. That score qualified him for the State of Michigan Competitive Scholarship in 1983. In 1989, after serving as a U.S. Army Infantry Sergeant, and during his time as an undergraduate at Michigan State University, Steve became an ACT instructor. He has been helping students prepare for success on the ACT and other standardized exams ever since. Steve attended The Thomas M. Cooley Law School on a full Honors Scholarship, after achieving a 99th percentile score on his Law School Admission Test (LSAT). In fact, Steve scored in the 99th percentile on every standardized test he has ever taken. While attending law school, Steve continued to teach standardized test prep classes (including ACT, SAT, PSAT, GRE, GMAT, and LSAT) on average of thirty hours each week, and tutored some of his 10110 law students in a variety of subjects and in essay exam writing techniques. Steve has also served as an instructor at the college and law school levels.

Thousands of students have benefited from Steve's instruction, coaching, and admissions consulting and have gone on to the colleges of their choice. His students have gained admission to some of the most prestigious institutions in the world and received many scholarships of their own. A few of them even beat his ACT score! Since 1997, Steve has served as the President of Advantage Education (www.AdvantagEd.com), a company dedicated to providing effective and affordable test prep education in a variety of settings, including classes and seminars at high schools and colleges around the country, summer College Prep Camps at The University of Michigan, and one-on-one via the Internet worldwide.

McGraw-Hill's 10 ACT Practice Tests

SECOND EDITION

Steven W. Dulan
and the faculty of
Advantage Education



New York New Orleans Chicago San Francisco Lisbon London Madrid Mexico City
Milan New Delhi Seoul Singapore Sydney Toronto

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Professional



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INTRODUCTION: USING THIS BOOK

This book contains ten simulated ACT practice tests. You can use these tests as "dress rehearsals" to get you ready for the whole experience of taking an ACT exam.

If you have enough time between now and your ACT (at least three weeks but preferably twelve to eighteen weeks), you should work through this entire book. If you have only a few days, try to complete as many practice tests as time allows. Even just a few hours of study and practice can have a beneficial impact on your ACT score.

Use this book as a companion to McGraw-Hill's ACT prep book.

HOW TO USE THE PRACTICE TESTS

Each practice test in this book is a full-length simulated ACT. Written by ACT experts, these tests are designed to be as close as you can get to the actual exam. The tests contain some variations in style and mix of question type. This approach is intentional so that you can get a taste of all the various formats and styles that can appear on an ACT exam. If you work through all of the material provided, you can rest assured that there won't be any surprises on test day. However, you should keep your score results in perspective. Generally, students tend to score slightly higher on each successive practice test. But the truth is that ACT exams are sensitive to factors such as fatigue and stress. The time of the day that you take the exams, your surroundings, and other things going on in your life can have an impact on your scores. Don't get worried if you see some variations due to an off day or because the practice test exposed a weakness in your knowledge base or skill set. Just use the information that you gather as a tool to help you improve.

There is an explanation for each of the practice questions in this book. You will probably not need to read absolutely all of them. Sometimes you can tell right away why you got a particular question wrong. We have seen countless students smack themselves on the forehead and say "stupid mistake." We try to refer to these errors as "concentration errors." Everyone makes them from time to time, and you should not worry when they occur. There is a good chance that your focus will be a little better on the real test as long as you train yourself properly with the aid of this book. You should distinguish between those concentration errors and any understanding issues or holes in your knowledge base. If you have the time, it is worth reading the explanations for any of the questions that were at all challenging for you. Sometimes, students get questions correct but for the wrong reason or because they guessed correctly. While you are practicing, you should mark any questions that you want to revisit and be sure to read the explanations for those questions.

A NOTE ON SCORING THE PRACTICE TESTS

The tests in this book are simulations created by experts to replicate the question types, difficulty level, and content areas that you will find on your real ACT. The Scoring Worksheets provided for each test are guides to computing

approximate scores. Actual ACT exams are scored from tables that are unique to each test. The actual scaled scores depend on a number of factors, which include the number of students who take the test, the difficulty level of the items (questions and answer choices), and the performance of all of the students who take the test. This means that "your mileage may vary." Do not get too hung up on your test scores; the idea is to learn something from each practice experience and to get used to the "look and feel" of the ACT.

Each Scoring Worksheet has formulas for you to work out an approximate scaled score for each section as well as an overall Composite Score. Each computation includes a "correction factor" which is an average correction derived from analysis of recent ACT exams. The correction factor is most valid for students whose scores are in the middle 50% of all scores. The correction factor starts to lose a bit of its effectiveness at the top and bottom of the scoring scale. This is not a major flaw in the practice tests; your actual ACT score report will include a "band" around each score. ACT, Inc., says right on the student's score report that they do this to highlight the fact that all test scores are just estimates.

UNDERSTANDING THE ACT

WHAT IS THE ACT?

The authors of the ACT insist that the ACT is an achievement test, meaning that it is designed to measure your readiness for college instruction. There is ongoing debate about how well the ACT accomplishes that mission. What is not debated is that the ACT is not a direct measure of intelligence. It is not an IQ test. The ACT is not a measure of your worth as a human being. It is not even a perfect measure of how well you will do in college. Theoretically, each of us has a specific potential to learn and acquire skills. The ACT doesn't measure your natural, inborn ability. If it did, we wouldn't be as successful as we are at raising students' scores on ACT exams.

The ACT actually measures a certain knowledge base and skill set. It is "trainable," meaning that you can do better on your ACT if you work on gaining the knowledge and acquiring the skills that are tested.

The ACT is broken up into four multiple-choice tests and one optional essay. The multiple-choice tests are called English, Mathematics, Reading, and Science Reasoning, respectively. They are always given in the same order. In fact, there is a lot of predictability when it comes to the ACT. The current exam still has very much in common with ACT exams from past years. This means that we basically know what is going to be on your ACT in terms of question types and content. The ACT Structure chart on the next page provides more information on the format of the ACT.

ACT offers a thirty-minute Writing Test as an optional component to the ACT. Many colleges and universities require applicants to take the Writing Test. Be sure to check with your schools of choice prior to registering for the test.

WHO WRITES THE ACT?

There is a company called ACT, Inc. that decides exactly what is going to be on your ACT exam. This group of experts consults with classroom teachers at the high school and college level. They look at high school and college curricula and they employ educators and specialized psychologists called "psychometricians" (measurers of the mind), who know a lot about the human brain and how it operates under various conditions. We picture them as "evil genius" researchers gleefully rubbing their hands together and trying to think up ways to keep you out of college. Don't fear, however; we are the "good geniuses" trying to get you into the college of your choice. We'll lay out the details of how you will be tested so that you can get yourself ready for the "contest" on test day.

REGISTERING FOR THE ACT

You must register for the ACT in advance. You can't just show up on test day with a number 2 pencil and dive right in. The best source of information for all things ACT is, not surprisingly, the ACT Web site, www.act.org. There is also a very good chance that a guidance counselor and/or pre-college counselor at

ACT Structure

English		
75 Questions	45 Minutes	
Content/Skills	Number of Questions	
Usage/Mechanics	40	40
Punctuation	10	10
Grammar/Usage		12
Sentence Structure	18	18
Rhetorical Skills	35	35
Strategy	12	12
Organization	11	11
Style		12
Mathematics		
60 Questions	60 Minutes	
Content	Number of Questions	
Pre-Algebra and Elementary Algebra		24
Intermediate Algebra and Coordinate Geometry	18	18
Plane Geometry	14	14
Polygonometry	4	4
Reading		
40 Questions	35 Minutes	
Passage Type	Number of Questions	
Prose Fiction	10	10
Social Science		10
Humanities	10	10
Natural Science	10	10
Science Reasoning		
40 Questions	35 Minutes	
Format	Number of Questions	
Data Representation passages	15	15
Research Summaries 3 passages		18
Conflicting Viewpoints 1 passage		7
Content Areas: Biology, Chemistry, Physics		

The ACT includes an optional 30-minute Writing Test which comes after the Science Reasoning Test.

your school has an ACT Registration Book, which includes all of the information that you need for your test registration.

WHY DO ACT EXAMS EXIST?

Back in the mid twentieth century, some people noticed that there was a disturbing trend in college admissions. Most of the people who were entering college came from a fairly small group of people who went to a limited number of high schools. Many had parents who had attended the same colleges. There wasn't much opportunity for students from new families to "break into" the higher education system. Standardized entrance exams were an attempt to democratize the situation and create a meritocracy where admissions decisions were based on achievement and not just social status. The ACT was not the first standardized college entrance exam. It came a little later as an attempt at improving on the older SAT.

Colleges use the ACT for admissions decisions and sometimes, for advanced placement. It is also used to make scholarship decisions. Since there are variations among high schools around the country, the admissions departments at colleges use the ACT, in part, to help provide a standard for comparison. There are studies that reveal a fair amount of "grade inflation" at some schools. So, colleges cannot simply rely upon grade point averages when evaluating academic performance.

ACT SCORES

Each of the multiple-choice sections of the ACT is called a Test. Each test is given a score on a scale of 1 to 36. These four "scaled scores" are then averaged and rounded according to normal rounding rules to yield a Composite Score. It is this Composite Score that is most often meant when someone refers to your ACT score.

Your actual score report will also refer to "subscores," which are reported for your English, Mathematics, and Reading Tests. These are based on your performance on a subset of the questions on each of these tests. Our experience has been that there is nothing to be gained from discussing them in detail with students. Reports indicate that many college admissions professionals don't have the faintest idea how to utilize them when making admissions decisions.

One important thing that can be said about scores is that you don't have to be perfect to get a good score on the ACT. The truth is that you can miss a fair number of questions and still get a score that places you in the top 1% of all test takers*. In fact, this test is so hard and the time limit is so unrealistic for most test takers that you can get a score that is at the national average (about a 21) even if you get almost half of the questions wrong. Use the scoring guidelines provided in this book to estimate your ACT score at each stage of your preparation.

WRITING TEST SCORING GUIDELINES

The ACT Writing Test is scored on a 2-point through 12-point scale. Two professional, trained readers will evaluate your answer and each of them will assign a point value of 1 (worst) through 6 (best); the two scores are then totaled. If the two readers assign scores that differ by more than 1 point, then a 3rd reader will be called in to read your essay and make the final decision regarding your score.

The scores are holistic scores, which means that your essay is judged as a whole without assigning point values to the specific characteristics that the

graders are looking for. Use the following guidelines when scoring your essays based on the sample prompts included in this book.

Score of 6: The essay takes a clear position and discusses other perspectives, including perspectives that may differ from the author's. The essay is logical and complete. There are good transitions and very little or no irrelevant information. The introduction and conclusion are solid and consistent with each other and with the argument. The essay predicts and deals with counter arguments. While there may be a few errors, they are minor and infrequent. Grammar, spelling, and punctuation are nearly perfect. Vocabulary is effective and appropriate.

Score of 5: The essay takes a clear position on the topic and might give an overall context. The essay deals with some of the complex issues surrounding the topic and at least raises some counter arguments. There are specific examples given. Organization is clear and concise even if it is not creative. Transition signals are used. The author uses language competently and there is some variation in word choice. Any errors present are relatively minor and not distracting.

Score of 4: The essay demonstrates an understanding of the issue and the purpose of the essay is clear. The author states a position on the main issue and at least raises some potential counter arguments. There is adequate development of ideas and some specific reasons and/or examples are given. There is some logical sequence. Most transitions are simple. There is some variety in sentence length and word choice. There are some distracting errors but the essay is still understandable.

Score of 3: The essay reveals that the author has some understanding of the task. There is a clear position but no real overall context is provided. There may be some mention of counter arguments but they are cursory or not clearly stated. The essay may be repetitious or redundant. The essay stays within the general subject but may stray from the specific issue. The organization is simple and predictable. Transitions, if any, are simple and predictable. Introduction and conclusion are present but not well developed. Word choice is generally appropriate and sentences lack variety in length or structure. There are distracting errors that impact understandability.

Score of 2: The essay shows that the author misunderstands the assignment. There is no position taken on the main issue or there are no reasons given. There may be a general example or two but no specific examples offered. There are problems with the relevance of some of the statements made. Transition words may be incorrect or misleading. There are several distracting errors that affect the understandability of the essay.

Score of 1: The author demonstrates almost no grasp of the assignment. The essay fails to take a position or fails to support a position taken. May be excessively redundant. There is little or no structure or coherence. There are several errors that nearly prevent understanding the author's point, if any.

Score of 0: The answer document is blank, the essay is on a topic of the author's own choosing, the essay is either completely or nearly illegible, or the essay is not written in English.

ANSWER SHEET

ACT PRACTICE TEST 1

Answer Sheet

ENGLISH ENGLISH

1	(A) (B) (C) (D)	21	21	(A) (B) (C) (D)	41	41	(A) (B) (C) (D)	61	61	(A) (B) (C) (D)
2	(F) (G) (H) (J)	22	(DODO)	(F) (G) (H) (J)	42	42	(F) (G) (H) (J)	62	62	(F) (G) (H) (J)
3	(A) (B) (C) (D)	23	23	(A) (B) (C) (D)	43	43	(A) (B) (C) (D)	63	63	(A) (B) (C) (D)
4	(F) (G) (H) (J)	24	24	(F) (G) (H) (J)	44	44	(F) (G) (H) (J)	64	64	(F) (G) (H) (J)
5	(A) (B) (C) (D)	25	25	(A) (B) (C) (D)	45	45	(A) (B) (C) (D)	65	65	(A) (B) (C) (D)
6	(F) (G) (H) (J)	26	26	(F) (G) (H) (J)	46	(DODO)	(F) (G) (H) (J)	66	66	(F) (G) (H) (J)
7	(A) (B) (C) (D)	27	27	(A) (B) (C) (D)	47	47	(A) (B) (C) (D)	67	67	(A) (B) (C) (D)
8	(F) (G) (H) (J)	28	28	(F) (G) (H) (J)	48	(E)	(F) (G) (H) (J)	68	68	(F) (G) (H) (J)
9	(A) (B) (C) (D)	29	29	(A) (B) (C) (D)	49	49	(A) (B) (C) (D)	69	69	(A) (B) (C) (D)
10	(DODO)	30	(DODO)	(F) (G) (H) (J)	50	50	(F) (G) (H) (J)	70	70	(F) (G) (H) (J)
11	(A) (B) (C) (D)	31	31	(A) (B) (C) (D)	51	51	(A) (B) (C) (D)	71	71	(A) (B) (C) (D)
12	(F) (G) (H) (J)	32	32	(F) (G) (H) (J)	52	52	(F) (G) (H) (J)	72	(E)	(F) (G) (H) (J)
13	(A) (B) (C) (D)	33	33	(A) (B) (C) (D)	53	53	(A) (B) (C) (D)	73	73	(A) (B) (C) (D)
14	(DODO)	34	34	(F) (G) (H) (J)	54	(E)	(F) (G) (H) (J)	74	(E)	(F) (G) (H) (J)
15	(A) (B) (C) (D)	35	35	(A) (B) (C) (D)	55	55	(A) (B) (C) (D)	75	75	(A) (B) (C) (D)
16	(F) (G) (H) (J)	36	36	(F) (G) (H) (J)	56	56	(F) (G) (H) (J)			
17	(A) (B) (C) (D)	37	37	(A) (B) (C) (D)	57	57	(A) (B) (C) (D)			
18	(E) (G) (J)	38	(E) (G)	(F) (G) (H) (J)	58	58	(F) (G) (H) (J)			
19	(A) (B) (C) (D)	39	39	(A) (B) (C) (D)	59	59	(A) (B) (C) (D)			
20	(F) (G) (H) (J)	40	(E)	(B) (J)	60	(E) (G)	(B) (J)			

MATHEMATICS MATHEMATICS

1	(A) (B) (C) (D) (E)	16	(F) (G) (H) (J) (K)	31	31	(A) (B) (C) (D) (E)	46	46	(F) (G) (H) (J) (K)
2	(F) (G) (H) (J) (K)	17	(A) (B) (C) (D) (E)	32	32	(F) (G) (H) (J) (K)	47	47	(A) (B) (C) (D) (E)
3	(A) (B) (C) (D) (E)	18	(F) (G) (H) (J) (K)	33	33	(A) (B) (C) (D) (E)	48	48	(F) (G) (H) (J) (K)
4	(F) (G) (H) (J) (K)	19	(A) (B) (C) (D) (E)	34	34	(F) (G) (H) (J) (K)	49	49	(A) (B) (C) (D) (E)
5	(A) (B) (C) (D) (E)	20	(F) (G) (H) (J) (K)	35	35	(A) (B) (C) (D) (E)	50	50	(F) (G) (H) (J) (K)
6	(F) (G) (H) (J) (K)	21	(A) (B) (C) (D) (E)	36	36	(F) (G) (H) (J) (K)	51	51	(A) (B) (C) (D) (E)
7	(A) (B) (C) (D) (E)	22	(F) (G) (H) (J) (K)	37	37	(A) (B) (C) (D) (E)	52	52	(F) (G) (H) (J) (K)
8	(F) (G) (H) (J) (K)	23	(A) (B) (C) (D) (E)	38	38	(F) (G) (H) (J) (K)	53	53	(A) (B) (C) (D) (E)
9	(A) (B) (C) (D) (E)	24	(F) (G) (H) (J) (K)	39	0000	(A) (B) (C) (D) (E)	54	54	(F) (G) (H) (J) (K)
10	(F) (G) (H) (J) (K)	25	(A) (B) (C) (D) (E)	40	40	(F) (G) (H) (J) (K)	55	55	(A) (B) (C) (D) (E)
11	(A) (B) (C) (D) (E)	26	(F) (G) (H) (J) (K)	41	41	(A) (B) (C) (D) (E)	56	56	(F) (G) (H) (J) (K)
12	(F) (G) (H) (J) (K)	27	(A) (B) (C) (D) (E)	42	42	(F) (G) (H) (J) (K)	57	57	(A) (B) (C) (D) (E)
13	(A) (B) (C) (D) (E)	28	(F) (G) (H) (J) (K)	43	43	(A) (B) (C) (D) (E)	58	58	(F) (G) (H) (J) (K)
14	(F) (G) (H) (J) (K)	29	(A) (B) (C) (D) (E)	44	44	(F) (G) (H) (J) (K)	59	59	(A) (B) (C) (D) (E)
15	(A) (B) (C) (D) (E)	30	(F) (G) (H) (J) (K)	45	45	(A) (B) (C) (D) (E)	60	60	(F) (G) (H) (J) (K)

READING

- | | | | |
|--------------------|-------------------------|--------------------|----------------------------|
| 1 (A) (B) (C) (D) | 11 (A) (B) (C) (D) | 21 (A) (B) (C) (D) | 31 (A) (B) (C) (D) |
| 2 (F) (G) (H) (J) | 12 (E) (G) (D) (J) | 22 (F) (G) (H) (J) | 32 (E) (G) (D) (J) |
| 3 (A) (B) (C) (D) | 13 (A) (B) (C) (D) | 23 (A) (B) (C) (D) | 33 (A) (B) (C) (D) |
| 4 (F) (G) (H) (J) | (D) (D) (F) (G) (H) (J) | 24 (F) (G) (H) (J) | 34 (D) (D) (F) (G) (H) (J) |
| 5 (A) (B) (C) (D) | 15 (A) (B) (C) (D) | 25 (A) (B) (C) (D) | 35 (A) (B) (C) (D) |
| 6 (F) (G) (H) (J) | 16 (F) (G) (H) (J) | 26 (F) (G) (H) (J) | 36 (F) (G) (H) (J) |
| 7 (A) (B) (C) (D) | 17 (A) (B) (C) (D) | 27 (A) (B) (C) (D) | 37 (A) (B) (C) (D) |
| 8 (F) (G) (H) (J) | (D) (D) (F) (G) (H) (J) | 28 (F) (G) (H) (J) | 38 (F) (G) (H) (J) |
| 9 (A) (B) (C) (D) | 19 (A) (B) (C) (D) | 29 (A) (B) (C) (D) | 39 (A) (B) (C) (D) |
| 10 (F) (G) (H) (J) | 20 (F) (G) (H) (J) | 30 (F) (G) (H) (J) | 40 (E) (F) (G) (H) (J) |

SCIENCE

- | | | | |
|--------------------|----------------------------|--------------------|--------------------|
| 1 (A) (B) (C) (D) | 11 (A) (B) (C) (D) | 21 (A) (B) (C) (D) | 31 (A) (B) (C) (D) |
| 2 (F) (G) (H) (J) | 12 (F) (G) (H) (J) | 22 (F) (G) (H) (J) | 32 (F) (G) (H) (J) |
| 3 (A) (B) (C) (D) | 13 (A) (B) (C) (D) | 23 (A) (B) (C) (D) | 33 (A) (B) (C) (D) |
| 4 (F) (G) (H) (J) | 14 (F) (G) (H) (J) | 24 (F) (G) (H) (J) | 34 (F) (G) (H) (J) |
| 5 (A) (B) (C) (D) | 15 (A) (B) (C) (D) | 25 (A) (B) (C) (D) | 35 (A) (B) (C) (D) |
| 6 (F) (G) (H) (J) | 16 (E) (Q) (Q) (G) (H) (J) | 26 (F) (G) (H) (J) | 36 (F) (G) (H) (J) |
| 7 (A) (B) (C) (D) | 17 (A) (B) (C) (D) | 27 (A) (B) (C) (D) | 37 (A) (B) (C) (D) |
| 8 (F) (G) (H) (J) | 18 (F) (G) (H) (J) | 28 (F) (G) (H) (J) | 38 (F) (G) (H) (J) |
| 9 (A) (B) (C) (D) | 19 (A) (B) (C) (D) | 29 (A) (B) (C) (D) | 39 (A) (B) (C) (D) |
| 10 (F) (G) (H) (J) | 20 (F) (G) (H) (J) | 30 (F) (G) (H) (J) | 40 (F) (G) (H) (J) |

RAW SCORES

SCALE SCORES

DATE TAKEN:

ENGLISH	_____	ENGLISH	_____	COMPOSITE SCORE
MATHEMATICS	_____	MATHEMATICS	_____	
READING	_____	READING	_____	
SCIENCE	_____	SCIENCE	_____	

Refer to the Scoring Worksheet on page 66 for help in determining your Raw and Scale Scores.

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If you need more

Read more [stories](#). [Please contribute](#)

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ENGLISH TEST

45 Minutes—75 Questions

DIRECTIONS In the passages that follow, some words and phrases are underlined and numbered. In the answer column, you will find alternatives for the words and phrases that are underlined. Choose the alternative that you think is best, and fill in the corresponding bubble on your answer sheet. If you think that the original version is the best choice, "NO CHANGE," which will always be either answer choice A or F. You will also find questions about a particular section of the passage, or about the entire passage. These questions will be identified either by an underlined portion or by a number in a box. Look for the answer that clearly expresses the idea, is consistent with the style and tone of the passage, and makes the correct use of standard written English. Read the passage through once before answering the questions. For some questions, you should read beyond the indicated portion before you answer.

PASSAGE 1

Hair-raising Problem's Problems

Why is it that we are so completely obsessed with the hair on our heads? Millions of dollars are spent each year on cutting, hair lengthening, hair, bleaching hair, straightening hair, curling hair, highlighting hair, and even growing hair whatever you can do to hair, someone is willing to pay money to do it. Natural redheads long

1. A. ~~NO CHANGE~~
B. ~~Obsessed~~
C. ~~obsessing~~
D. ~~obsessioned~~

to be brunettes and dishwater blondes dream of shiny golden tresses. Both men and women cringe at the sight of each gray hair, teenagers enjoy weekly experiments With magenta dyes, spikes, and tangerine streaks.

2. F. ~~NO CHANGE~~
G. ~~pay~~
H. ~~paying~~
J. ~~have paid~~

Each gray hair is a teenager's opportunity. Exactly experiments With magenta dyes, spikes, and tangerine streaks.

3. A. ~~NO CHANGE~~
B. ~~to have~~
C. ~~to be~~
D. ~~becoming~~

All of these thoughts cross my mind as I examine the result of my most recent hair adventure. As a mature

4. F. ~~NO CHANGE~~
G. ~~however~~
H. ~~yet~~
J. ~~and~~
5. A. ~~NO CHANGE~~
B. ~~result for~~
C. ~~result with~~
D. ~~result by~~

GO ON TO THE NEXT PAGE.

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woman watching the gray hairs mixing in rapidly with my

6

natural brunette tones, I decided over a year ago, to

7

approach my stylist with the idea of highlights. Having

seen many of my peers go this route, I figured that

highlighting was for to be the answer to my reluctance to

8

look my age.

Ill me monthly highlighting went. Well, excepting for

those times when my hair turned out a little 100 subdued,

9

making me 100 partially gray instead of blonde. [2] I

suffered through it remarkably well, saying to myself,

"She'll get it right next time." 13 For the most part,

10

I've enjoyed my year of highlights so so that I

bravely approached Donna, my stylist, two months ago

and proclaimed that I'd done with wimpy highlighting

and ready to go blonde. 14 The result was not quite what

I expected, but I resolved to live with it. [5] Donna was

surprised at my suggestion, but quickly began my

unbridled enthusiasm as she gathered appropriate

chemicals and concoctions that would soon transform me.

Three months later, I find myself seesawing between

tears laughter as I attempt to cover up a patch of

13

nearly bald scalp on the top of my head. For someone who

has long been fanatical about the appearance of her hair,

this absence of hair has proven to be quite a challenge to

my ego and self-confidence. I've always enjoyed styling

my hair, and suddenly, I have nothing to style.

6. F. NO CHANGE
G. rapidly mixing
H. mixed rapidly in
J. rapidly mix in to

7. A. NO CHANGE
B. ago to
C. ago to: to
D. ago to, ago to,

8. F. NO CHANGE
G. was being
H. of been
J. was

9. A. NO CHANGE
B. well, except
C. well except
D. Well, Except

10. F. NO CHANGE
G. Also
H. Instead
J. In light of this

11. 1. the sake or logic and coherence. Sentence 5 should be placed:
A. Where it is now.
B. before Sentence 1.
C. after Sentence 2.
D. between Sentence 3 and Sentence 4.

12. F. NO CHANGE
G. she gathering
H. she had to gathering
J. she gathered

13. A. NO CHANGE
B. along with
C. or
D. well as

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time I begin to experience a new pang or disgust of disgust
 despair over this new hair anomaly, I again ask again ask
 myself why we are so obsessed with the hair on our heads. our heads.
 The answer always comes to me in a flash in a simple
 two-word two-word pure vanity. Soon after this realization, realization,
 I evase my crying. (U) crying. [14]

14. The writer is considering deleting the preceding sentence. If the sentence was deleted, the essay would primarily lose:
- F. a summary of the essay.
 - G. the narrator's ability to put situation into perspective.
 - H. a stylistic link to the essay's introduction.
 - J. an understanding of the author's purpose in writing the essay.

Question 15 asks about the preceding passage as a whole.

15. Suppose the writer had chosen to write a how-to article for people wanting to change their hair color. Would this essay fulfill the writer's goal?
- A. Yes, the author's approach to changing her own hair color would also help the anxiety of others wishing to do the same.
 - B. Yes, this essay emphasizes the universality of people changing (twice) hairstyles and hair color.
 - C. No, because this article only deals with the narrator's own experimentation with her hair and does not provide steps for others to do the same.
 - D. NO, because the essay discourages people from changing their hair color.

PASSAGE II

A Modern Blacksmith

You will probably never find his name in a history book, hut to this day, Walker, Walker continues to contribute to Anw-nca heritage. Walker is an old-fashioned modern-

16

day blacksmith Who still practices the line art of manipulating metal over a hot line. In his words, "Blacksmithing is no dying art!"

16. F. NO CHANGE
 G. American heritage.
 H. American's heritage.
 J. American's heritage.
17. A. NO CHANGE
 B. Who still continues to practice
 C. Who continues to still practice
 D. who practices still

GO ON TO THE NEXT PAGE.

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Walker had begun his career in hand-forged ironwork at the age of 30. The idea of creating an object or iron, a most intractable material, appealed to him. He stalled on this new venture by collecting and reading every book he could find that described the process of blacksmithing: its history, its practical and decorative uses, and the equipment needed to establish and outfit his own smithy. During the course of his research, Lee discovered a 100-pound anvil necessary for the sort of blacksmithing he wanted to do. A heavy block of iron or steel upon which a blacksmith lumbers and shapes the malleable metal.

Lee bought his first anvil from 84-year-old Hurley Alford, a templeton or Philadelphia, it home to Michigan in the back of a 4-11 county bus. The anvil weighed 100 pounds, about the minimum size Walker needed to get started in his craft.

Lee's first anvil cost him \$100, and four months later, he paid \$75 for an additional implement—a vice—from Cornell University in New York. This important tool also made way back to Michigan in the back of a 4-11 county bus.

Lee had spent the summer carting 4-H groups out from Michigan to the east coast for

18. F. NO CHANGE
G. had begun
H. begun
J. twgan

19. Which of the following alternatives to the underlined portion would NOT be acceptable?
A. one of the most intractable metals, iron,
B. a most intractable material that being iron
C. a iron (a most intractable material)
D. a most intractable material, iron,

20. Which choice most emphasizes the difficulty in moving the large anvil?
F. NO CHANGE
G. taking
H. driving
J. transporting

21. At this point, the writer wants to express how first Lee first began the craft of blacksmithing. Which choice would most effectively accomplish this task?
A. NO CHANGE
B. continue
C. keep going
D. move on

22. F. NO CHANGE
G. its
H. its'
J. the

23. A. NO CHANGE
B. Carting 4-11 groups out from Michigan to the east coast for various county fairs and expositions, Lee had spent the summer hammering.
C. Lee had spent the summer, for various county fairs and expositions, carting 4-H groups out from Michigan to the east coast.
D. OMIT the underlined portion.

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various county fairs and expositions.

23

Once ²³ Obtained his first portable forge, he was ready ²⁴ to build his blacksmith shop commonly referred to as a "smithy." ²⁴ In the interest of economy, he constructed this shop out of inexpensive oak planks and tarpaper. It

was a cruddy little shack but ²⁵ only nine years. Lee, who by then was completely hooked on blacksmithing, replaced his first shop with a liner one made of more extensive wood; this shop also had glass windows, a definite improvement over Lee's original "smithy."

III "The very first object forged was a long, Exmed Hudson Bay dagger. ²⁶ Many people refer to this type of knife as a "dag." ²⁶ As he recalls that event he says, "From the minute I first saw the thing take shape, I was hooked. I still am."

There's an element of magic in it to me. You heat it up and pound it with a hammer and it where you want it to go." ²⁷ [41] Years later, at a family event, Lee discovered that his Italian ancestors were accomplished coppersmiths.

151 During ²⁷ a gathering, Lee's great uncle Johnny was proclaiming that Lee's propensity for blacksmithing was "in the blood" as ²⁸ happily presented. With a new

125-pound anvil. ²⁹

24. Given that all of the choices are true, which one would most effectively effectively in the subject of this paragraph?

F. No CHANGE

G. Obtaining a portable forge for the shop proved to be Lee's biggest challenge.

H. Blacksmith shops can be difficult to construct, but most challenging task is "Killing new necessary equipment into it."

J. A blacksmith's forge requires some type of blower in order to keep the fire hot enough to bend the steel.

25. A. NO CHANGE

B. that stood for

C. Which standing for

D. and stands for

26. F. NO CHANGE

G. long pointed,

H. long, and pointed

J. long-pointed

27. A. NO CHANGE

B. later at a family event,

C. later, at a family event, Lee,

D. later, at a family event,

28. F. NO CHANGE

G. proclaimed

H. had been proclaiming

J. having proclaimed

29. Which of the following sentences in this paragraph is LEAST relevant to the main idea of the essay and, therefore, could be deleted?

A. Sentence 1

B. Sentence 2

C. Sentence 4

D. Sentence 5

GO ON TO THE NEXT PAGE.

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As an ~~oulsick~~ ^{observer} observer ~~walkers~~ ^{Walker} Walker Lee
~~ix-nding and shaping a hot metal rod into some~~
~~recognizable form, it is difficult to discern the origin of the~~
~~magic lee spoke of, is it in the glowing orange steel or in~~
 Walker himself?

30. F. ~~NO CHANGE~~
 G. ~~was watching~~
 H. ~~had been watching~~
 J. ~~watched~~

PASSAGE III

Scorpion Spare Scare

As my sister ~~begins by telling me about the~~
~~scorpion in her bed that stung~~ ³¹ ~~her as she~~
~~slumbered, I could feel my eyes popping out of my head~~
~~and my jaw dropping to~~ ³² ~~the floor. She seemed so calm~~
~~telling me this story and all I could think about~~
~~was how that she's lucky to~~ ³³ ~~be alive. Diana's terrifying story~~

31. A. ~~NO CHANGE~~
 B. ~~begin~~
 C. ~~had begun~~
 D. ~~began~~
 32. F. ~~NO CHANGE~~
 G. ~~slumbered~~
 H. ~~slumbered~~
 J. ~~slumbered~~
 33. A. ~~NO CHANGE~~
 B. ~~could have thought~~
 C. ~~think~~
 D. ~~had thought~~

~~continued detailing how~~ ³⁴ ~~her husband threw back the bed~~
~~covers began heating the dreaded thing~~ ³⁵ ~~With a broom, and~~
~~then quickly flushed it down the toilet. Only later did they~~
~~learn that the corpse should have been kept for~~
~~identification purposes. Some Arizonan scorpions~~
~~are deadlier than others, and it is important to know which~~
~~species is responsible for a given~~ ³⁶ ~~attack.~~

34. F. ~~NO CHANGE~~
 G. ~~tkRausee~~
 H. ~~how she is~~
 J. ~~she is~~
 35. A. ~~NO CHANGE~~
 B. ~~flush~~
 C. ~~flushing~~
 D. ~~flushes~~
 36. F. ~~NO CHANGE~~
 G. ~~are more deadlier than others~~
 H. ~~being more deadly than others~~
 J. ~~more deadly than Others~~

My sister ~~characteristically chose not to seek medical~~
~~treatment as~~ ³⁷ ~~up to her first swelled, then ached~~
~~With pain, and finally~~ ³⁸ ~~became numb and useless.~~
~~As her condition worsened, she searched~~ ³⁹ ~~Internet for~~
~~general information, discovering time and again that~~
~~species identification is important in administering proper~~
~~care to the sting victim.~~

37. Assuming that all of the choices are true, which one best links the preceding sentence with the rest of the paragraph?
 A. You could say that Diana is afraid of hospitals, doctors, and nurses.
 B. Most scorpion bites should be examined by a medical professional.
 C. My sister's physician treated many scorpion bites.
 D. Symptoms of a scorpion sting can vary from one person to another.

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Scorpions will sting anyone they accidentally encounter

as they crawl inadvertently into human habitats. Most rats. Most

problems occur at construction sites where the

natural homes have been upset and uprooted by

bulldozers and dump trucks on ninety scorpion

species native to the United States. 30 percent live in

Arizona. Unfortunately, one of those species is

Bark Scorpion just about the only whose venom is

considered truly dangerous and even fatal to humans.

My sister and her husband just moved into a new home

a year ago, and dozens of homes are still being built all

around them. This, indeed, is a perfect explanation for the

presence of a scorpion in their bedclothes. Scorpions hide

during the day and search for food and water at night.

Arizonans will tell you that it's a good idea to refrain from

going barefoot in dark, both outside and inside.

Slipping your shoes and clothes before putting on them on

wouldn't hurt, either, particularly if you know you're in an

area where scorpions have been. Wherever there is

one scorpion, there are probably dozens more that can be

easily detected with a black light at night when they're on

move. the move.

[II] IT a scorpion happens to sting. "A, please don't

follow my sister's example. [21] All medical facilities in

Arizona have antivenin on hand. [31] Seek medical

38. F. NO CHANGE
G. inadvertently crawl
H. are crawling inadvertently
J. crawl

39. A. NO CHANGE
B. scorpion's naturally
C. scorpion, natural
D. scorpions' natural

40. F. NO CHANGE
G. In Arizona, about 30 percent of the ninety scorpion
H. Arizona has about 30 percent of the ninety scorpion
J. Of the ninety species of scorpions, 30 percent
native to the United States live in Arizona.

41. A. NO CHANGE
B. Bark Scorpion Which is just about the only species
C. only one that is the Bark Scorpion species,
D. Bark Scorpion, yet just about the only species

42. II 4. author were to delete the phrase "both outside
and inside," the essay would primarily lose a detail
that:
F. adds essential information to the discussion of
Arizona.
G. is not particularly necessary to the impact of the
essay.
J. adds an element of humor to the essay's theme.

43. A. NO CHANGE
B. happened to sting
C. happen to sting
D. stung

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treatment immediately, especially if you've flushed the critter down the toilet and have no way of knowing the exact nature of the perpetrator. [41] In this way, you will certainly save yourself from some amount of pain and discomfort, and you might even save your life. [44]

44. For the sake of coherence, Sentence 2 should be placed:
- F. Where it is now.
 G. Before sentence 1.
 H. After sentence 3.
 J. Omit it; it is not relevant to the paragraph.

Question 45 asks about the preceding passage as a whole.

45. Suppose the writer intended to write a medical column that would offer professional advice on the treatment of scorpion stings. Would this essay successfully fulfill this goal?
- A. Yes, because this essay describes the steps that need to be taken if a person is stung by a scorpion.
 B. Yes, because it is clear in the essay that the writer possesses professional knowledge on the topic of scorpion stings.
 C. No, because the writer is describing only one personal incident about a scorpion sting and is offering personal, not professional, advice.
 D. No, because there are too many species of scorpions to allow a short essay to provide professional advice on treatment of scorpion stings.

PASSAGE IV

Unfulfilled Promises

If you have ever entered a contest on any of any sort, you are well aware of the legal requirements, exclusions, and

disclaimers that always accompany the contest's entry form. Many laws today regulate a contest sponsor's responsibilities to entrants, and courts are filled with lawsuits, ⁴⁷ ~~asserting~~ ^{with} non-compliance on both sides. However, this was not always the case. ⁴⁸

In 1896, a contest motivated a Norwegian immigrant, Helga Estby, to travel nearly 35 miles on foot from the state of Washington to New York City. Unfortunately, as is still sometimes true, Helga won the competition

46. F. NO CHANGE
 G. sort; you
 H. sort; you
 J. sort; you
47. A. NO CHANGE
 B. always are accompanying
 C. ;company always
 D. are by accompanying
48. F. NO CHANGE
 G. lawsuits, asserting non-compliance
 H. lawsuits, of non-compliance, asserting
 J. non-compliance lawsuits, asserting
49. A. NO CHANGE
 B. on foot, 35 miles
 C. 3,500 miles on foot
 D. 3,500 miles per foot

GO ON TO THE NEXT PAGE.

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only to find that the promise award was mysteriously absent.

50. F. NO CHANGE
G. promise for the
H. promised
J. promising

[1] Helga had been living on her farm with her husband and nine children in Spokane, Washington, when she read or a \$10,011 prize being offered to a woman who was willing to walk across the country. [2] Because the Estby farm was facing foreclosure, Helga decided that walking across the country in a bicycle skirt for that kind of money

51. A. NO CHANGE
B. been living
C. has been living
D. had lived

was a small price to pay for a greater reward. [3] At the

52. F. NO CHANGE
G. greatly rewarding
H. great reward
J. greatest reward

time, this style of skirt was considered inappropriate because it was the female ankle. The only requirement from all accounts that she wear a nuxem, newfangled bicycle skirt as she traveled.

53. Which of the following sequences of sentences makes this paragraph most logical?
A. NO CHANGE
B. 1, 3, 2, 4
C. 3, 2, 4, 1
D. 1, 4, 3, 2

So, in May of 1896, Helga and her 11-year-old daughter, Clara, had set off on their long journey.

54. F. NO CHANGE
G. have set off
H. set off
J. went to set off

Helga carried a revolver and a spray gun containing red pepper for protection. Presumably, Helga and Clara found food and shelter along the way and they arrived in New York City in December, seven months after their

55. A. NO CHANGE
B. For protection, Helga carried a revolver as well as a red pepper-containing spray gun.
C. Helga carried a revolver and a spray gun containing red pepper.
D. Carried by Helga for protection were a revolver and a spray gun containing red pepper.

departure. The sponsors, however, were to be round nowhere.

56. F. NO CHANGE
G. were nowhere when found
H. to be found nowhere
J. were nowhere to be found

mis story of bravery and persistence

It therefore been kept a secret for nearly a century, primarily because Helga's seven-month absence from the farm wreaked havoc on her family. Two of her children died of diphtheria while she was gone. Even worse, her husband had sequestered the surviving children in an

57. A. NO CHANGE
B. had been kept a secret
C. had been actually kept a secret
D. had in fact kept a secret

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unheated, thinking that this was the only way to keep them from being infected with the disease. Since the contest sponsor failed to award Helga the money, the Estbys ended up losing the farm; her expedition had been a disaster.

At the time, Helga's trip was considered an embarrassment by the Norwegian American community and was kept utterly quiet. After Helga's death, her own children burned the hundreds of pages Helga had written through the years, leaving only a small scrapbook of newspaper clippings and very few details on Helga's life or her ill-rated trip. Looking back 100 years, one can only marvel at the boldness and bravery that must have energized Helga Estby to make that journey on foot across the country in an effort to save a family farm.

58. F. NO CHANGE
G. years leaving only
H. years; leaving only
J. years leaving only,

59. Given that all of the choices are true, which one would best conclude the sentence while providing the reader with the most specific explanation for Helga's motivation to walk across the country?
A. NO CHANGE
B. to win \$10,000.
C. in an effort to save children from diphtheria.
D. to help her daughter, Clem, gain experience.

Question 60 asks about the preceding passage as a whole.

60. At this point, the writer is considering adding the following sentence:
- In 1984, Helga's great-great-grandson wrote a story about his ancestor for a history assignment.
- Should the writer make this addition here?
- F. Yes, because it links the ending of the essay to its introduction.
G. Yes, because this information is highly relevant to the rest of the essay.
H. No, because this story might not focus on Helga's farm.
J. No, because this information introduces a new subtopic of the essay.

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PASSAGE 1 PASSAGE V

Following paragraphs may or may not be in the most logical order. You may be asked questions about the logical order of the paragraphs, as well as where to place logically within any given paragraph.

Jet Lag Jet Lag

[1]

Traveling across time zones particularly via airplane, can be very disconcerting to the human body, both physically and mentally. When you "gain" or "lose" time going from

Point A to Point B, a condition (desynchronosis) likely affects you in some form. Jet lag is normally considered a disorder, although it is normally a temporary

condition and not as serious as other sleeping dysfunctions.

121

[2]

term "circadian" originates from the Latin *circa*, meaning "about" and *diem* or "day." Circadian rhythms refer to a variety of daily bodily functions such as temperature changes, sleep patterns, and digestive functions. Normally, the body operates on a 24-hour time period that coincides with the earth's 24-hour cycle of night and day, and the human body generally falls into a routine of sleeping and waking that is regular changes in body temperature, breathing and digestion

take place. In most,

66

Who's inner clocks cause more sleepiness from 3:00 p.m. to 5:00 p.m. and again from 3:00 a.m. to 5:00 a.m. Body temperature usually rises as the day goes on, quickly drops around midnight, and then begins

61. A. NO CHANGE
B. zones particularly
C. zones particularly
D. zones particularly

62. Given that all of the choices are true, which one would provide the most detailed and relevant information at this point in the essay?
F. No CHANGE
G. a condition called desynchronosis, commonly known as jet lag.
H. a condition known as *desynchronosis*
J. a condition or jet lag

63. A. NO CHANGE
B. not serious
C. as serious as not
D. as serious as

64. Which of the following sentences would most effectively introduce the subject of this paragraph and act as a transition from the preceding paragraph?
F. Many scientific words have Latin origins.
G. Sleeping disorders can produce a great deal of stress and anxiety.
H. Most travelers are unaware of the exact moment that they leave one time zone and enter another.
J. Traveling across time zones over a short period of time disturbs the body's circadian rhythms.

65. A. NO CHANGE
B. waking regular
C. waking, during which regular
D. waking. Regular

66. F. NO CHANGE
G. Likewise
H. Instead
J. For example

67. A. NO CHANGE
B. of our inner clocks
C. whose inner clocks
D. of us inner clock's

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the cycle of rising again just before 6:00. Since these changes occur on a twenty-four-hour cycle, so abrupt time zone changes can understandably upset the body's

68. F. NO CHANGE
G. However, these
H. Because these
J. These

highly well-tuned in system or regulation.

69. A. NO CHANGE
B. Well-tuned
C. highly tuned well
D. high

Some symptoms of jet lag include excessive daytime sleepiness or some level of insomnia at night; changes in appetite and/or digestion; moodiness and difficulty concentrating. Often, after traveling on a plane for

70. F. NO CHANGE
G. Often, after a lot of traveling on a plane for long periods
H. After traveling for long periods on a plane some times
J. Traveling for long periods on a plane

long periods, people will also experience headaches, dry sinuses, earaches, and bloating. However, these symptoms

71. A. NO CHANGE
B. are more likely to be attributable
C. are attributable more likely
D. are more likely attributable

are more likely to be attributable to the conditions of the

72. F. NO CHANGE
G. dry pressurized
H. dry, pressurized
J. do' pressurized

airplane cabin, which has a very dry pressurized atmosphere, and are not symptomatic of jet lag.

[4]

III • There are steps that can be taken to alleviate the effects of jet lag, primarily as preventive measures.

12 First, it might be helpful to slightly alter your sleeping schedule for several days before your trip. If you are

73. Which of the following alternatives to the underlined portion would NOT be acceptable?
A. trip. When traveling east for example,
B. trip. If you are going east for example,
C. trip. For example, if you are going east,
D. trip. If you are going east for example,

going east, for example, go to bed one hour earlier and rise

the next day an hour earlier so that you will be somewhat more acclimated to the new time zone. 14 Regulating your

exposure to light can also be helpful, since light and

darkness serve as triggers to the brain. 15 Before traveling

west, expose yourself to evening light and avoid early

morning light for several days as a way of simulating the

new time zone you're headed toward. 16 Some say it

takes about a day for every hour of time zone change to

completely adjust to just new time zone. 17 Unfortunately

1



1

1

For many, that formula often coincides precisely with

return trip. 184 Avoiding caffeine and alcohol

may also aid your body in adjusting to its new

environment. 74

74. For the sake of logic and coherence, this paragraph, Sentence 8 should be placed:

- F. where it is now.
- G. after Sentence 4.
- H. before Sentence 6.
- J. before Sentence 7.

Question 75 asks about the preceding passage as a whole.

75. The writer wishes to add the following sentence in order to show that jet lag can sometimes be a more serious problem:

There are those, however, who routinely fly across continents either for pleasure or business, and jet lag can become a more serious issue for these people.

The new sentence would best support and be placed at the end of paragraph:

- A. 1
- B. 2
- C. 3
- D. 4

END OF THE ENGLISH TEST.

STOP! IF YOU HAVE TIME LEFT OVER, CHECK YOUR WORK ON THIS SECTION ONLY.



MATHEMATICS TEST

60 Minutes – 60 Questions

DIRECTIONS: Solve each of the problems in the time allowed, then fill in the corresponding bubble on your answer sheet. Do not spend too much time on any one problem; skip the more difficult problems and go back to them later. You may use a calculator on this test. For this test you should assume that figures are NOT necessarily drawn to scale, that all geometric figures lie in a plane, and that the word *line* is used to indicate a straight line.

DO YOUR FIGURING HERE.

1. Shannon walked $1\frac{2}{3}$ miles on Wednesday and $2\frac{3}{5}$ miles on Thursday. What was the total distance, in miles, Shannon walked during those 2 days?

- A. $3\frac{5}{8}$
- B. $3\frac{2}{5}$
- C. $4\frac{4}{15}$
- D. $4\frac{1}{3}$
- E. $5\frac{1}{3}$

2. $4x^3 \times 3xy^2$ is equivalent to:

- E. $9x^3y^4$
- G. $9r^4y^4$
- H. $24x^3y^4$
- J. $24x^5y^4$
- K. $24x^5y^6$

3. Mr. Wilk is a high school math teacher whose salary is \$33,660 for this school year, which has 180 days. In Mr. Wilk's school district, substitute teachers are paid per day. Mr. Wilk takes a day without pay and a substitute teacher is paid to teach his classes how much less does the school district pay in salary by paying a substitute teacher instead of Mr. Wilk for that day?

- A. \$57
- B. \$85
- C. \$102
- D. \$114
- E. \$187

4. A student has earned the following scores on four 100-point tests: this marking period: 63, 72, 68, and 91. What must the student earn on the final 100-point test or the marking period to earn an average test grade of 80 for the five tests?

- F. 79
- G. 86
- H. 89
- J. 94

- K. The student cannot earn an average of 80.

GO ON TO THE NEXT PAGE.

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5. The oxygen saturation of a lake is found by dividing the amount of dissolved oxygen the lake water currently has per liter by the dissolved oxygen capacity per liter of the water, and then converting that number into a percent. If the lake currently has 6.4 milligrams of dissolved oxygen per liter of water and the dissolved oxygen capacity is 9.5 milligrams per liter, what is the oxygen saturation level of the lake, to the nearest percent?

- A. 64%
B. 67%
C. 70%
D. 89%
E. 95%

6. A rectangular lot that measures 125 feet by 185 feet is completely fenced. What is the length, in feet, of the fence?

- E. 310
F. 310
G. 435
H. 620
J. 740
K. 1,240

7. The expression $a(b+c)$ is equivalent to:

- A. $ab + ac + ad$
B. $ab - ac + d$
C. $ab - ac + ad$
D. $ab - c + d$
E. $a - c + d$

8. If $6x - 3 = -5x + 7$, then $x =$?

- F. $\frac{4}{11}$
G. $\frac{10}{11}$
H. $\frac{11}{10}$
J. $\frac{1}{2}$
K. 10

9. What two numbers should be placed in the blanks below so that the difference between the consecutive numbers is the same?

13, __, __, 34

- A. 19, 28
B. 20, 27
C. 21, 26
D. 23, 24
E. 24, 29

10. If x is a real number such that $x^3 = 729$, then $x^2 + \sqrt{x} =$?

- F. 9
G. 27
H. 30
J. 84
K. 90

GO ON TO THE NEXT PAGE.



11. The formula for the volume, V , of a sphere with radius r is $V = \left(\frac{4}{3}\right)\pi r^3$. If the radius of a baseball is $1\frac{1}{3}$ inches,

DO YOUR FIGURING HERE.

What is the volume, to nearest cubic inch?

- A. 6
B. 8
C. 10
D. 14
E. 15
12. If a gumball is randomly chosen from a bag that contains exactly 6 yellow gumballs, 5 green gumballs, and 4 red gumballs, what is the probability that the gumball chosen is green?

- F. $\frac{2}{3}$
G. $\frac{1}{3}$
H. $\frac{2}{5}$
J. $\frac{3}{5}$
K. $\frac{4}{15}$

13. The number of students participating in fall sports at a certain high school can be shown with the following matrix:

Tennis	Soccer	Cross-Country	Football
25	30	50	80

The athletic director estimates the ratio of the number of sports awards that will be earned to the number of students participating with the following matrix:

Tennis	0.2
Soccer	0.5
Cross-Country	0.3
Football	0.4

Given these matrices, what is the athletic director's estimate for the number of sports awards that will be earned for these fall sports?

- A. 55
B. 60
C. 65
D. 67
E. 74

GO ON TO THE NEXT PAGE.

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DO YOUR FIGURING HERE.

Use the following information to answer questions 14–15.

The following chart shows the current enrollment in all social studies classes—Geography, US History, World Cultures, and Government—at Iron Mountain High School.

Course	Course title	Section	Period	Enrollment
	Geography	A	1	23
		B	2	24
US History	US History	A	2	25
		B	3	29
		C	4	24
World Cu	World Cultures	A	3	27
	Government	A	4	26
		B	6	27

14. What is the average number of students per section in US History?

- F. 25
- G. 26
- H. 27
- J. 29
- K. 34

15. The school wants to have all of the students enrolled in social studies classes read the same book at the same time so that the author or the book can speak to the students at an assembly. The school originally purchased two classroom sets of 30 books each, but now one set is missing 3 books and the other is missing 5. For which or the following class periods, if any, are there NOT enough books available for each student to have one book?

- A. Period 2 only
- B. Period 3 only
- C. Period 4 only
- D. Period 3 and 4 only

There are enough books for _____ books _____ class period

GO ON TO THE NEXT PAGE.



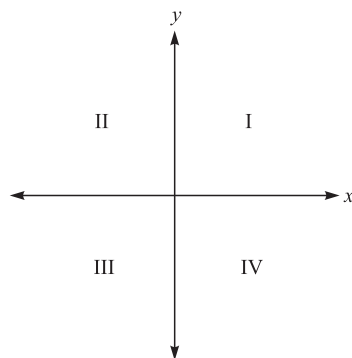
16. What expression must the center cell of the table below contain so that the sums of each row and each column are equivalent?

DO YOUR FIGURING HERE.

$-4x$	$9x$	$2x$
$7x$		$-3x$
$4x$	$-5x$	$8x$

- F. $5x$
 G. $3x$
 H. 0
 J. $-x$
 K. $-4x$

17. Point A is to be graphed in a quadrant not on an axis of the standard (x,y) coordinate plane below. If the x-coordinate and the y-coordinate of point A are to have the same signs, point A must be located in:



- A. Quadrant I only
 B. Quadrant II only
 C. Quadrant III only
 D. Quadrant IV only
 E. Quadrant I or II only
 F. Quadrant II or III only

18. Reggie knows how to make 5 different entrees, 4 different side dishes and 6 different desserts. How many distinct complete meals, each consisting of an entrée, a side dish and a dessert, can Reggie make?

- F. 16
 G. 26
 H. 72
 J. 120
 K. 144

19. At a bottling plant, 10,000 liters of carbonated water are needed to produce 3,000 bottles of soda. How many liters of carbonated water are needed to produce 15,000 bottles of soda?

- A. 225
 B. 1,500
 C. 2,500
 D. 4,000
 E. 5,000

GO ON TO THE NEXT PAGE.



20. A rectangle measures 20 meters by 15 meters. What is the length of the diagonal of the rectangle?

F. 52
G. 68
H. 72
J. 112
K. 2,704

21. For all positive integers a , b , and c , which of the following expressions is equivalent to $\frac{a}{c}$?

A. $\frac{a \times b}{c \times b}$
B. $\frac{a \times a}{c \times c}$
C. $\frac{a \times c}{c \times a}$
D. $\frac{a - b}{c - b}$
E. $\frac{a + b}{c + b}$

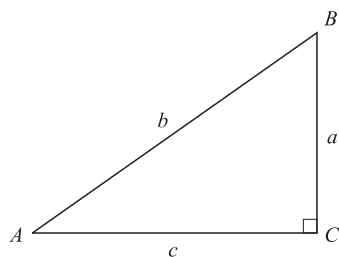
22. What is the slope-intercept form of $6x - 2y - 4 = 0$?

F. $y = 6x - 2$
G. $y = 3x + 2$
H. $y = 3x - 2$
J. $y = -3x + 2$
K. $y = -6x - 4$

23. Which of the following is a solution to the equation $x^2 + 25x = 0$?

A. 50
B. 25
C. 5
D. -5
E. -25

24. For the right triangle ABC shown below, what is $\tan B$?



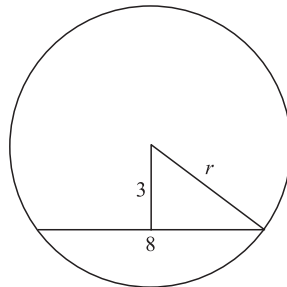
F. $\frac{a}{b}$
G. $\frac{a}{c}$
H. $\frac{b}{a}$
J. $\frac{c}{a}$
K. $\frac{c}{b}$

GO ON TO THE NEXT PAGE.

2 2A \triangle AAA \triangle \triangle \triangle AAAA2 \triangle \triangle \triangle 2

25. A chord 8 inches long is 3 inches from the center of a circle, as shown below. What is the radius of the circle, to the nearest tenth of an inch?

DO YOUR FIGURING HERE.



- A. 4.0
B. 4.3
C. 5.0
D. 6.9
E. 8.5
26. The length in meters of a spring is given by the equation $E = C(1 + \frac{2}{3}L)$, where E is the applied force in newtons. Approximately what force, in newtons, must be applied for the spring's length to be 0.23 meters?
- F. 0.12
G. 0.18
H. 0.20
J. 0.24
K. 0.27
27. A Snowstorm City workers removed an estimated 1000 cubic meters of snow from downtown area. If this snow were spread in an even layer over an empty lot with dimensions 62 meters by 62 meters, about how many meters deep would the layer of snow be?
- A. Less than 1
B. Between 1 and 2
C. Between 2 and 3
D. Between 3 and 4
E. More than 4

GO ON TO THE NEXT PAGE.

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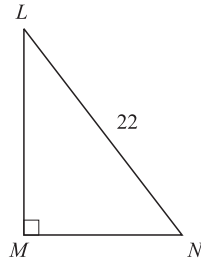
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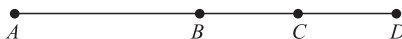
28. hypotenuse of the right triangle LMN shown below is 22 feet long. The cosine of angle L is $\frac{3}{4}$. How many feet long is the segment LM?



- F. 18.4
G. 16.5
H. 11.0
J. 6.7
K. 4.7
29. The table below shows the number of pounds of apples grown last year in 4 cities. (Each whole apple on the graph represents 1,000 pounds of apples.) According to the graph, what fraction of the apples grown in all 4 cities were grown in Appleton?

City	Apples grown
Golden Hills	
Red Falls	
Appleton	
Shady Acres	

- A. $\frac{5}{24}$
B. $\frac{1}{4}$
C. $\frac{1}{6}$
D. $\frac{5}{19}$
E. $\frac{3}{16}$
30. Points B and C lie on segment AD, as shown below. The length of segment AD is 25 units; the segment AC is 19 units long and the segment BD is 14 units long. How many units long is segment BC?



- F. 5
G. 6
H. 8
J. 11
K. Cannot be determined from the given information.

GO ON TO THE NEXT PAGE.



31. What is the x -coordinate of point in standard (x, y) coordinate plane at which the lines $y = -2x - 7$ and $y = -3$ intersect?

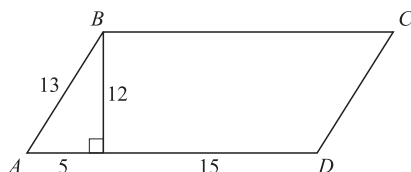
DO YOUR FIGURING HERE.

- A. 10
B. 5
C. 3
D. 2
E. 1

32. For all pairs of real numbers S and T where $S = 4T - 7$, $T = ?$

- F. $\frac{S}{4} - 7$
G. $\frac{S}{4} + 7$
H. $4S + 7$
J. $\frac{S - 7}{4}$
K. $\frac{S + 7}{4}$

33. Parallelogram $ABCD$, with dimensions in inches, is shown in the diagram below. What is the area of the parallelogram, in square inches?



- A. 60
B. 72
C. 180
D. 240
E. 260
34. If $b = a + 3$, then $(a - b)^4 = ?$
- F. 81
G. 27
H. -3
J. -27
K. -81

GO ON TO THE NEXT PAGE.

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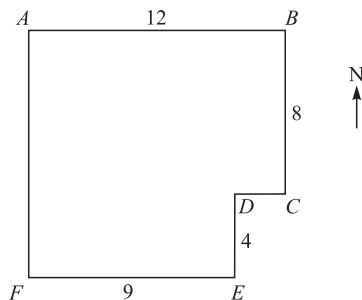
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35. A park has the shape and dimensions, in miles, given below. The park office is located halfway between point A and point D. Point D is the location of the park's borders run east-west or north-south. (Note: The park's borders run east-west or north-south.)

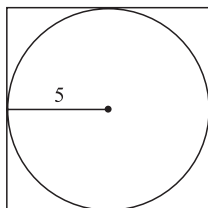


- A. 3 miles east and 4 miles north
B. 4 miles east and 4 miles south
C. 4 miles east and 4 miles south
D. 6 miles east and 4 miles south
E. 6 miles east and 4 miles south
36. The larger number exceeds three times the smaller number by 4. The sum of the two numbers is 58. If x is the smaller number, which equation below determines the correct value of x ?
- F. $3(2x + 4) + 4x = 58$
G. $3(2x - 4) + 3x = 58$
H. $2(3x + 4) + 2x = 58$
J. $2(3x + 4) + 4x = 58$
K. $2(2x - 4) + 4x = 58$
37. Members of the fire department lean a 26-foot ladder against a building. The side of the building is perpendicular to the level ground so that the base of the ladder is 10 feet away from the base of the building. To the nearest foot, how far up the building does the ladder reach?
- A. 12
B. 15
C. 20
D. 22
E. 24

2 2A \triangle AAA \triangle \triangle \triangle \triangle \triangle \triangle 2

38. A square is circumscribed about a circle. Of a 5-foot radius, as shown below. What is the area of the square, in square feet?

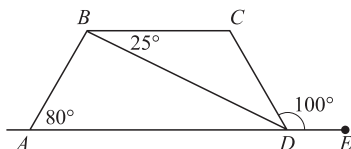
DO YOUR FIGURING HERE.



- 144 F. 144
G. 100
H. 2.6 J. 25 π
J. 50 J. 50
K. 25
39. The ratio of the side lengths of a triangle is exactly 7:13. In a second triangle similar to the first, the shortest side is 9 inches long. The nearest tenth of an inch, what is the length of the longest side of the second triangle?
- A. 14.1
B. 15
C. 16.7
D. 17.3

Cannot be determined from the given information.

40. In the figure below, $ABCD$ is a trapezoid. E lies on line AD , and angle measures are as marked. What is the measure of angle CDB ?

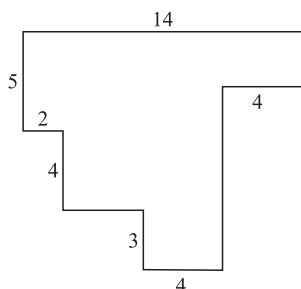


- F. 25°
G. 30°
H. 55°
J. 80°
K. 100°

GO ON TO THE NEXT PAGE.



41. In the figure shown below, two intersecting lines meet at a right angle, and all the lengths are given in inches. What is the perimeter, in inches, of the figure?



42. Of the 517 graduating seniors at Brighton High School, approximately $\frac{1}{5}$ will be attending college, and approximately $\frac{1}{2}$ of those going to college will be attending a state college. Which of the following is the closest estimate of the number of graduating seniors who will be attending a state college?
43. Let x or $(x - 2y)$ for all integers x and y . Which of the following is the value of $5(-3)$?
44. If 125% of a number is 425, what is 65% of the number?
45. What is the distance in the standard (x, y) coordinate plane between the points $(2, 3)$ and $(5, 5)$?



46. The ratio of the radii of two circles is $9:16$. What is the ratio of their circumferences?

F. 324
 G. $9:16$
 H. $18:32$
 J. $3:4$
 K. $9\pi:16$

47. A circle in the standard (x, y) coordinate plane is tangent to the x -axis at 4 and tangent to the y -axis at 4 . Which of the following is an equation of the circle?

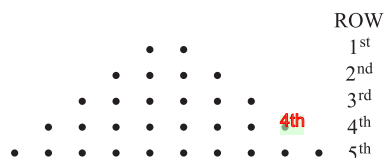
A. $x^2 + y^2 = 4$
 B. $x^2 + y^2 = 16$
 C. $(x - 4)^2 + (y - 4)^2 = 4$
 D. $(x + 4)^2 + (y - 16)^2 = 16$
 E. $(x + 4)^2 + (y + 16)^2 = 16$

48. Using the complex number i , where $i^2 = -1$,

$$\frac{2}{(1-i)} \times \frac{(1+i)}{(1+i)} = ?$$

F. $1 + i$
 G. $i - 1$
 H. $1 - i$
 J. $2(1 + i)$
 K. $2(1 - i)$

49. Which of the following describes the total number of dots in the first n rows of the triangular arrangement below?



A. 30
 B. $2n$
 C. n^2
 D. $n(n + 1)$
 E. $2n + 2(n - 1)$

50. Allen polled a class of 24 students by a show of hands. He found that 9 students play soccer and 21 students play basketball. Given that information, what is the number of students in the class who must play both soccer and basketball?

F. 0
 G. 1
 H. 3
 J. 6
 K. 9

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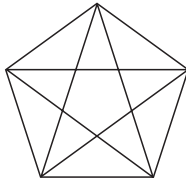
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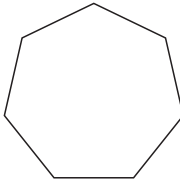
51. Which of the following is a set of all real numbers x such that $x + 2 > x + 5$?

A. The set containing only zero
 B. The set containing all nonnegative real numbers
 C. The set containing all negative real numbers
 D. The set containing all real numbers
 E. The empty set

52. Pentagons have 5 diagonals illustrated. How many diagonals does the heptagon (7 sides) have?



Pentagon



Heptagon

F. 7
 G. 12
 H. 14
 J. 21
 K. 28

53. John wants to draw a circle graph showing his friends' favorite ice cream flavors. When he polled his friends asking each for his favorite flavor or cream, 5% of his friends said chocolate, 20% of his friends said vanilla, 15% of his friends said strawberry, 25% of his friends said mint chocolate chip, and 5% of his friends said Nava Sother than previously listed. What will be the degree measure of the vanilla sector on the circle graph?

A. 1260
 B. 1080
 C. 90°
 D. 72°
 E. 36°

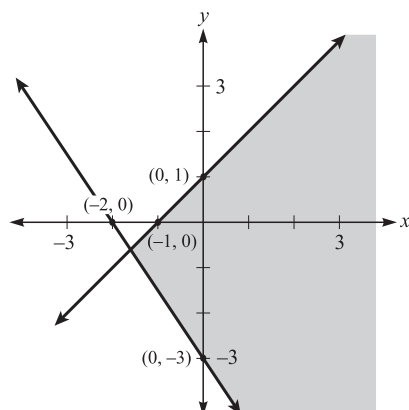
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54. If $\sin \theta = \frac{4}{5}$ and $\frac{\pi}{2} < \theta < \pi$, then $\tan \theta = ?$

DO YOUR FIGURING HERE.

- F. $-\frac{5}{4}$
 G. $-\frac{4}{3}$
 H. $-\frac{3}{5}$
 J. $\frac{4}{3}$
 K. $\frac{3}{4}$

55. Which of the following systems of inequalities is represented by the shaded region of the graph below?



- A. $y \leq x + 1$ or $y \geq x - 3$
 B. $y \leq x + 1$ and $y \geq x - 3$

C. $y \leq x + 1$ or $y \geq \left(-\frac{3}{2}\right)x - 3$

D. $y \leq x + 1$ and $y \geq \left(-\frac{3}{2}\right)x - 3$

E. $y \leq x + 1$ and $y \geq \left(-\frac{3}{2}\right)x - 3$

56. If $f(x) = 2x^2 + 3$, then $f(x+h) = ?$

F. $2x^2 + h^2$

G. $2x^2 + h + 3$

H. $2x^2 + 2h^2 + 3$

J. $x^2 + 2xh + h^2 + 3$

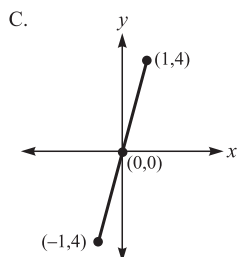
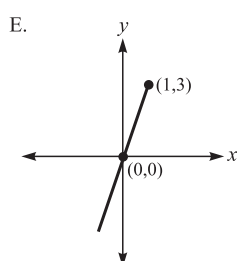
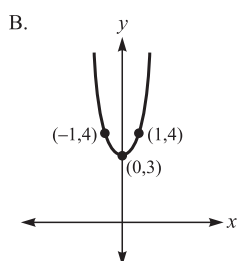
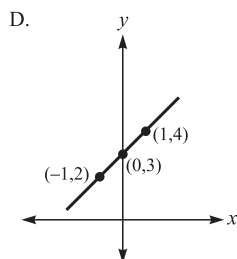
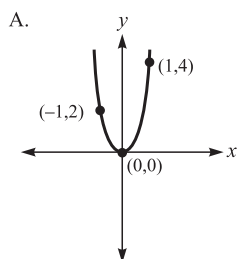
K. $2x^2 + 4xh + 2h^2 + 3$

GO ON TO THE NEXT PAGE.



51. Which of the following is the graph of the function, $y = \frac{x^2 + 3x}{x}$?

(x, y) coordinate plane of y =



58. A triangle, $\triangle ABD$, is reflected across the y-axis to have the image $\triangle B'D'D'$ in the standard (x, y) coordinate plane: thus A reflects to A' . The coordinates of point A are (m, n) . What are the coordinates of point A' ?

F. $(-m, n)$

G. $(m, -n)$

H. $(-m, -n)$

J. (n, m)

K. Cannot be determined from the given information.



59. If $x = 3r - 4$ and $y = 3r + 2$, which of the following expresses y in terms of x ? **DO YOUR FIGURING HERE.**

- A. $y = x + 2$
 B. $y = x + 6$
 C. $y = 9r + 14$
 D. $y = 6r - 2$
 E. $y = 3x + 14$

What is $\cos \alpha$ given that $\frac{\pi}{12} = \frac{\pi}{3} - \frac{\pi}{4}$ and that

$\cos(\alpha - \beta) = (\cos \alpha)(\cos \beta) + (\sin \alpha)(\sin \beta)$?

O

$\sin \theta$	$\cos \theta$	$\cos \theta$
$\frac{\pi}{6}$	$\frac{1}{2}$	$\frac{\sqrt{3}}{2}$
$\frac{\pi}{4}$	$\frac{\sqrt{2}}{2}$	$\frac{\sqrt{2}}{2}$
$\frac{\pi}{3}$	$\frac{\sqrt{3}}{2}$	$\frac{1}{2}$

- F. $\frac{1}{4}$
 G. $\frac{1}{2}$
 H. $\frac{\sqrt{6} + \sqrt{2}}{4}$
 J. $\frac{\sqrt{3} + \sqrt{2}}{2}$
 K. $\frac{\sqrt{6} + 2}{4}$

END OF THE MATHEMATICS TEST.
STOP! IF YOU HAVE TIME LEFT OVER, CHECK YOUR WORK ON THIS SECTION ONLY.

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3

READING TEST

35 Minutes 40 Questions

DIRECTIONS: This test includes four passages, each followed by ten questions. Read the passages and choose the best answer to each question. After you have selected your answer, fill in the corresponding bubble on your answer sheet. You should refer to the passages as often as necessary when answering the questions.

PASSAGE 1

PROSE FICTION: This passage is adapted from Joseph Conrad's *The Heart of Darkness*, 1899. © 1899.

"The Nellie, a cruising ship, swung to her anchor without a flutter of the sails, and was at it. The tide had in, the wind was nearly calm, and being hauled down river, the only thing for the ship was to wait to and wait for the tide.

"The Director of Companies was our captain and our host. We four affectionately watched his back as he stood in the bow looking toward the sea. The whole river there was nothing that looked half so nautical. He resembled a pilot, which to a seaman is a trustworthy personified. It was difficult to realize his work was not out there in the luminous estuary, but behind him, within the brooding gloom.

Between us there was a little already said somewhere, the bond of the sea. Besides holding our hearts together through long periods of separation, it had the effect of making us tolerant of each other's stories—and even convictions. The Law—the best of Old fellows—Alta, because of his many years and many virtues, the only cushion on deck and Wits lying on the only rug. The Accountant had brought a little bag of dominos, and a cross-legged, leaning against the mast. He had sunken cheeks, a yellow complexion, a straight back, and with his arms dropped, the palms of his hands outwards, resembled an idol.

The Director, satisfied the anchor had good hold, nudged his way forward and sat down amongst us. We exchanged a few words lazily. Afterwards there was silence on board the vacant. For some reason or another we did not begin that game of dominoes. We felt meditative and fit for nothing but placid staring.

"And this 'also,' said Marlow suddenly, 'has been one of the dark places of the earth.' He said the only man of us who still followed the sea. The worst that could be said of him was that he did not represent his class—always the same in their unchanging surroundings, round foreign shores, foreign faces glide past, veiled not by sense of mystery but by a slightly disdainful ignorance; for there is nothing mysterious

to a seaman unless it be the sea itself, which is the mistress of his existence and as inscrutable as destiny. For the rest, after his hours of work, a casual stroll or a casual spree on shore suffices to unfold for him the secret of a whole continent, and generally he finds the secret not worth knowing. The stories of seamen have a direct simplicity, the whole running of which lies within the cracked hull. But Marlow was not typical, and his meaning, an epismic, was not inside like a kernel but outside, enveloping the tale, which brought it all into a glow, brought out a haze, in the likeness of one of these misty halos that sometimes are made visible by the illumination of moonshine.

His remark did not seem at all surprising. It was just like Marlow. It was accepted in silence. No one took the trouble to grunt even; and presently he said, very very was thinking of very old times, when the Romans first came here, nineteen hundred years ago." (And, at last, in its survival and imperceptible fall, the sun sank low, and from glowing white changed to a dull red, without rays and without cheer, as if about to go suddenly, stricken, to death by the touch of that gloom brooding over a crowd of men.)

Marlow broke off. A answer glided in the river, small green names, red names, white flames, pursuing, overtaking, joining, crossing each other, separating slowly. Or hastily. The traffic of that great city went on in the dark night upon the sleepless river. We looked unobtrusively at one another, else to do, but it was all a long silence when he said, in a hesitating voice, "I suppose you fellows remember I did once turn fresh-water sailor for a bit," that we knew we were fated, were fated, began to run to live about one of Marlow's inconclusive experiences.

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The narrator's point of view is that of:
A. an Omniscient Observer.
B. a member of the ship's crew.
C. another ship's captain.
D. a person watching from shore.

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2. It can reasonably be inferred from the passage that the crew likely did not play dominoes because:
- E they were simply too tired.
- G they did not get along well enough to play a game together.
- H the Director of WCR did not have approved of game-playing.
- J the sea was too rough.
3. Which of the following are explanations given by the narrator as to why the lawyer used the ship's only cushion?
- I. He was very old.
- He would not allow anyone else to use it.
- III. He was greatly respected by the ship's crew.
- A. I and II only
- B. I only
- C. I and III only
- D. II only
4. As it is used in line 32, the word placid means:
- E calm.
- G straightforward.
- H nervous.
- J playful.
5. According to the passage, how was Marlow unlike typical seamen?
- A. Marlow was content in one place, while most men of the sea prefer to roam and explore.
- B. Marlow believed his home was ship, while most sailors believed their home was the sea.
- C. Marlow found sea inexplicable and full of mysteries, while a typical sailor understands the mysteries of the water.
- D. Marlow told complicated and ambiguous tales, while most seamen prefer to tell simple and clear tales.
6. It can be reasonably inferred from the passage that Marlow is about to tell a story:
- E that explains why he is now a freshwater sailor.
- G that is short and funny, like most of the stories he tells.
- H that had a profound effect on him.
- J about a man that he saved from drowning in a river.
7. According to the passage how did the men aboard the *Nellie* feel about the Director?
- A. They respected and liked him.
- B. They thought he was lazy.
- C. They despised and rejected him.
- D. They thought that he was gloomy.
8. The reaction of the narrator to Marlow's story can be most accurately described as:
- F malicious annoyance.
- G resigned tolerance.
- H genuine interest.
- J appreciation.
9. According to the passage, which of the following was not an effect of the "bond of the sea" (line 15)?
- A. It allowed the men to look past each other's criminal backgrounds.
- B. Men did not mind listening to other's wandering tales.
- C. It eased the loneliness or extended periods of time away from each other.
- D. The men were able to be more tolerant of each other's beliefs.
10. The main point of the second paragraph is:
- F. The ship's captain is better suited to an aviator than a sailor.
- G. The captain is unaware of the great amount of hard work that lies ahead of him.
- H. An unqualified and inexperienced businessman is sewing as the captain of the *Nellie*.
- J. The narrator and other crew members greatly respect their ship's captain.

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PASSAGE II

SOCIAL SCIENCE The passage discusses some social and economic issues regarding liquid natural gas as an energy source.

Although oil and gasoline remain important energy sources, it is natural gas that currently supplies around 20% of America's energy needs. A recent study shows that natural gas use was roughly 22 trillion cubic feet (TCF) annually, and demand is increasing at phenomenal rates because of its ability to create cleaner, fuel for electrical power. Experts predict that annual demand is likely to increase to almost 32 TCF in less than a decade. At a consumption rate of 32 TCF per year, the United States would only have about a five-year supply of natural gas. Known natural gas reserves in North America are quickly becoming exhausted. In fact, in the past thirty years, known supplies have dwindled from almost 300 TCF to around

150 TCF.

It is no wonder that natural gas has become a controversial and critical topic of discussion among politicians, business leaders, and consumers. It is apparent that the United States will need to drastically increase imports of natural gas to relieve shortages. One way that economists believe can be done is by importing liquid natural gas. Experts predict that liquid natural gas imports will increase by almost 50% in a few short years. Currently, the country imports very little liquid natural gas, and this is the most obvious reason why America has been reluctant to choose liquid natural gas over other energy sources. Converting natural gas into liquid natural gas involves cooling natural gas as it is collected to -260°F. This transforms the gas into a liquid, which is then injected into a specially designed vessel for transport. When the liquid natural gas reaches its destination, the liquid is reheated into its original gaseous state and allowed to flow into a pipeline. Even though new technology considerably decreases transportation costs for liquid natural gas, it is still an uneconomical process. One of the largest misconceptions about liquid

natural gas is that it is an abundant source of natural gas. While liquid natural gas imports continue to increase, the public demand for natural gas increases at an even higher rate. Even though the United States has facilities that can process liquid natural gas, these facilities are consistently unable to obtain enough liquid natural gas to operate at their fullest capacity. Even when liquid natural gas is obtainable, there is a fear that low natural gas prices in the United States will make liquid natural gas uneconomical. Most business leaders and politicians are reluctant to create new facilities to process liquid natural gas because these facilities are expensive and risky. It thus limits the capacity to process liquid natural gas even if it becomes more readily available.

The United States also faces competition from Asia in securing liquid natural gas. Competition for liquid natural gas most likely becomes even more ferocious as other populous countries like Japan and

China become more desperate for fuel sources. Some of the more daring politicians and business leaders believe that building new liquid natural gas facilities will help companies and consumers take advantage of future increased liquid natural gas imports. Currently, Canada is the largest liquid natural gas supplier for the United States. However, liquid natural gas imports from Canada will decrease considerably in the next decade as Canadian consumption increases and supplies of natural gas dwindle. Therefore, consumers and business workers should not rely on liquid natural gas to solve America's energy needs and consumers should continue to expect high prices as demand grows and supplies decline.

According to the passage, current known North American supplies of natural gas are:

- sufficient to provide the United States with natural gas for the next thirty years.
- down approximately 50% from thirty years ago.
- decreasing at a rate of 2% per year.
- extremely difficult to access.

The author of the passage would most likely agree with which of the following statements?

- Liquid natural gas will be a viable source of energy in the United States.
- America's energy needs will not be met by the use of liquid natural gas alone.
- populations in Japan and China are growing too rapidly to be served by liquid natural gas.
- Until a more reliable energy source is discovered, liquid natural gas is the solution to the world's energy problems.

One of the main ideas of the passage is that:

- energy sources are dwindling around the world.
- natural gas supplies outweigh one quarter of America's energy needs.
- liquid natural gas takes millions of years to form.
- known supply of liquid natural gas is limited.

It can be inferred from the second paragraph (lines 16–38) that America's reluctance to liquid natural gas over other energy sources will:

- not prevent America from importing more liquid natural gas from other countries.
- induce Japan and China to build new liquid natural gas processing facilities.
- likely continue until the cost and problems with liquid natural gas are reduced.
- lead to a decrease in the current demand for liquid natural gas in other countries, such as Canada.

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15. According to the passage, which of the following countries supplies most liquid natural gas to the United States?
- Japan.
 - China.
 - Canada.
 - Asia.
16. According to the third paragraph (lines 39-44), misconceptions exist about liquid natural gas regarding:
- its abundance.
 - the expense of converting it.
 - public demand for it.
- 1 only
 - 11 only
 - 11 and 111 only
 - 1, 11, and 111
17. As it is used in line 6, the word *phenomenal* most nearly means:
- annual.
 - efficient.
 - extraordinary.
 - inconsequential.
18. The passage states that all of the following are reasons for America's reluctance to choose liquid natural gas EXCEPT:
- the expense of transporting liquid natural gas.
 - the increasing demand for liquid natural gas.
 - the difficulty in processing liquid natural gas.
 - the possibility of low natural gas prices.
19. The passage states that which of the following is true about natural gas?
- It currently supplies more than half of America's energy needs.
 - The United States has an unlimited supply of natural gas.
 - Canada is the world's largest exporter of natural gas.
 - Annual demand for natural gas is increasing at a rapid rate.
20. As it is used in line 32, the word *vessel* most nearly means:
- process.
 - source.
 - facility.
 - container.

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PASSAGE 111

HUMANITIES: passages adopted from The Nature of Goodness by George Herbert Palmer
©1903.

My reader may well feel that goodness is already the most familiar all little thou. **gl'wainingsyo'** and yet he may at the time suspect somewhere that there's something about perplexity of family certainty. It's attending all our wishes and projects as objects as nothing else does, so does, so that no estate influence can be excessive. When we take a walk, read a hook, pick out a dress, visit a friend, attend, cast a vote, enter into business, we always do it in the hope of attaining something good. Since they are so frequently encountering goodness both laymen and scholars are apt to assume that this is altogether clear and requires no explanation. But the very is the truth. Familiarity obscures. It breeds instincts and without understanding. So woven has goodness become with the very web of life that it is hard to disentangle.

Consequently, we employ the word "good" for some synonym or during pretty much every waking hour of our lives. Wishing, some less or less frequently, turned to Shakespeare and, and four or five times, I turned to "goodness" and its derivatives "goodness," "better," and "about," many more. He could not make up his mind and women talk right without incessant reference to this concept.

How do we employ the "good"? I do not ask how we ought to employ it, but how we actually do. For the way we shall be engaged in psychological inquiry is not an ethical one. We need to get at the plain facts of usage. I will therefore ask each reader to look into his own mind, see on what occasions he uses the word, and decide what meaning he attaches to it. Taking up the simplest possible examples, we will through our inquiry when and why we call things good.

Here is a knife. When is it a good knife? Why?
A knife is made for something; for cutting. Whenever
a knife slides evenly through a piece of wood, and
With a minimum effort on the part of him who steers
it, Wiven it has no disposition to bend or
break, only do its appointed work effectively,
then we know that a good knife is at work. Or looking
at the matter from another point of view, whenever
the handle of the knife neatly fits the hand following its
lines and presenting no obstruction, we can say that
in these respects the knife is a good one. That is,
the knife comes good adaptation to its work.

an adaptation, realigned in the culling of the wood and in its conformity to the hand. Its goodness always has reference to something outside itself, and is measured by its performance of an external task.

Or take something not so palpable. What glorious weather! When we woke this morning, drew aside our curtains and looked out, we said "It is a good day!" And of what qualities of the day were we thinking? We "Rant, I suppose, that the day was well tilted to its various purposes, intending it to go to our unice, we saw there was nothing to hinder our doing so. We knew that Streach would check a people in an amiable mood.

business and social duties would move forward easily. In fact, whatever our plans in calling the day a good day we meant to speak of it as excellently adapted to something outside of itself.

A usage more curious still occurs in the nursery. There when the question is asked, "Has the baby been good?" one discovers by degrees that the anxious mother wishes to know if it has been crying or quiet. This elementary life has as yet not acquired positive standards of measurement. It is reckoned in negative terms, a failure to disturb.

This is a criticism of the word "nothing" in the
 remark of Shakespeare's Portia. Nothing is good
 without respect. "We must have some respect or end in
 mind in reference to which the goodness is compared."
 Good always means "for." That ill reposition
 cannot be absent. Our minds, though it need not
 audibly uttered, knife is for cutting and the
 day for business. Omitt the for and goodness ceases.
 'To be bad' or 'good' implies external reference. To be
 good means to mean efficient means; and the end to
 be furthered must already in mind before the word
 good is spoken.

In short, whenever we inspect the usage of the word good, we always find behind it an implication of some end which is reached. Good, then, is a relative term. The good is useful, and it must be useful for something. Silent or spoken, it is the mental reference to something else which puts all meaning into it. So Hamlet Says, Where's nothing either good or bad, but thinking makes it so. No new quality is added to an object or act when it becomes good.

21. One of the main arguments the author is trying to make in the passage is that:

A. **good** always connotes **same** idea no matter the context of the usage, whether people realize it or not.

B. although the word goods is used frequently, the exact definition and connotation of the word is difficult to identify precisely.

C. things or people are either good or not good; goodness is not a quality that is debatable.

D. a debate of ethics, not psychology, will most clearly identify the exact definition and connotation or the word good.

22. The main idea of the sixth paragraph (lines 63–69) is that:

F. it is irrelevant for a mother to inquire if baby well-behaved Or not.

G. a baby has not been alive long enough to be judged as either good or bad.

11. since the baby is so young, it is not judged as good
by what it does, but rather what it does not do.

J. whether, or not a baby has been crying is not a significant standard upon which to determine its goodness.

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According to the passage, why does the author concern himself with Shakespeare's usage of the word "good"?

- A. He was seeking confirmation for his belief that both the use of the word and the concept of good are strikingly common.
- B. He was looking for a definition of the concept of good and turned to Shakespeare for inspiration.
- C. He was trying to understand the lack of the concept of good and goodness in works of Shakespeare.
- D. He was seeking support for his belief that Shakespeare was able to use the concept of good more effectively than any other author.

24. The author of the passage asserts that the weather and a knife are similar because:

- E. both are deemed as good if and only if they can be helpful to many people for a variety of reasons.
- G. neither can be defined as good unless they remain consistent and unchanged in the wake of fluctuating circumstances.
- H. both are deemed good when their characteristics serve appropriate external circumstances.
- J. neither one can be good unless a universal definition or the concept is accepted.

25. As it is used in line 70, the word "lucidity" most nearly means:

- A. obscurely.
- B. inappropriately.
- C. enthusiastically.
- D. coherently.

26. The author argues that a knife may be described as good:

- E. only if it cuts wood.
- G. only if it is made for something other than cutting.
- H. only if it relates to something other than itself.
- J. only if it requires extra effort in its use.

27. As it is used in the passage, the word "palpable" most nearly means:

- A. apparent.
- B. powerful.
- C. drab.
- D. complicated.

28. The main argument that the author tries to make in the seventh paragraph (lines 70-71) is that:

- F. it is always clear what is when someone describes something as good.
- G. the concept of being good is entirely different than the concept of being good for.
- H. it is often easier to understand the concept of good without using the phrase "good for."
- J. the word "good" is relative, finding meaning only when there is a specific end in mind.

29. It can be reasonably inferred from the passage that the author would agree that the word "good" actually means:

- A. measurable.
- B. significant.
- C. persistent.
- D. practical.

30. When, referring to the role of goodness in life, the author states, "no estimate of its influence can be excessive" (lines 6-7), he most likely means that:

- G. people must be careful not to allow the search for goodness to monopolize their lives.
- H. it is impossible to over-emphasize the power that the quest for goodness has on us.
- I. it is impossible to conceptualize and grasp the definition of word "good."
- J. people often inaccurately describe the role that goodness plays in their own lives.

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PASSAGE PASSAGE IV

NATURAL SCIENCE: The Armored Armadillo

Meandering along the shoulder of the highway, the armadillo is surprisingly unaffected by its surroundings. This nomad of the desert appears to have no cares in the world, and really why should he when he carries on his back a natural suit of armor? He looks far more awkward than do animals yet this alien creature handles himself remarkably well. For such a

into an aggressive form of defense. Although his shell is far from impenetrable, an armadillo can rest assured that he is safer than many animals who wander the Texas roads.

Dasyus novemcinctus, or **nine-banded armadillo**, is characterized by the bands of bony plates and leathery skin that cover the animal's back, sides, tail, and the top of its head, creating a somewhat turtle-like shell. The interesting thing about the nine-banded armadillo is that the number of bands on its back may be anywhere between eight and eleven; nine is just the most common number. Contrary to popular belief, only one species of armadillo can curl itself into a ball; the three-banded armadillo does this as its primary defense against predators. Other armadillos often scurry under thorn bushes, rather like tanks, strengthening their position.

Armadillos are on average two and a half feet long and typically weigh eight and a half pounds, although there are different sizes. Those numbers can vary dramatically. Nine-banded females give birth to four to five young, while the three-banded armadillo gives birth to only one. The nine-banded armadillo is the only species of armadillo in which this remarkable trait occurs.

Four-month-long gestation period is more than enough time for the offspring to develop as they are born fully formed with their eyes open. After a few hours they begin to walk and are able to distance from their mothers after only a few months. Few animals are able to outrun a startled armadillo, and if chased into its burrow, the animal is able to arch its armor against the burrow walls, making the armadillo nearly impossible to become dislodged; this is quite frustrating to dogs and other animals who would like to dig the armadillo out. In addition, threats of being eaten by a predator, the armadillo must also endure a more severe danger: automobiles. A significant number of armadillos die each year after being struck by cars.

Armadillos can be found in the northern parts of South America and as far north as the State of Texas. Nine-banded armadillos prefer warm climates and like to build burrows in the wet streambeds. While they share with other species, rabbits and opossums, armadillos are nocturnal, and they spend their evenings digging for grubs and other invertebrates which make up the majority of their diet.

Most Texans see the armadillo as a pest, since the creatures have a tendency to ruin corn by eating the parts of the plants that are low to the ground; they

occasionally will eat other farm vegetables as well. Armadillos provide some benefits, however, as they eat many annoying and harmful insects and are often used in medical research. Interestingly enough, they are the only mammals besides humans that can contract leprosy.

While armadillos are seen as strange and often troublesome animals, they are unique and valuable for research. This armored native of the south will most likely continue to charm people for many years to come.

31. The author likens armadillos scurrying under thorn bushes to tanks strengthening their positions" in Paragraph 2 because:

- A. armadillos are well armored and thorn bushes give them even more protection.
- B. an armadillo's shell is as hard as steel.
- C. the scurrying of an armadillo sounds like a tank rolling over land.
- D. the armadillo resembles a tank in appearance.

32. The author calls the armadillo an "alien creature" in the first paragraph because:

- F. not much is known about armadillos.
- G. armadillos come from another planet.
- H. armadillos are very aggressive.
- J. an armadillo's unique appearance makes it stand out.

33. The passage indicates that, unlike some other desert animals, armadillos:

- A. lack a means of defending itself.
- B. can go without drinking water for long periods of time.
- C. reproduce many times each year.
- D. can withstand most predators' attacks.

34. As it is used in the passage (line 42), the phrase "arch its armor" most nearly means:

- F. to construct.
- G. to curve.
- H. to dig.
- J. to fight.

35. Based on information in the passage, the author feels that the nine-banded armadillo is especially unique because:

- A. it can curl into a ball.
- B. it is the rarest of armadillos.
- C. it gives birth to four identical young.
- D. its diet consists entirely of grubs.

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36. The passage indicates that most Texans consider the armadillo to be both:
 E rare and sacred.
 G strange and interesting.
 H annoying and helpful.
 J valued and dangerous.
37. What does the passage state is one of armadillo's greatest threats?
 A tanners' farmers.
 B cars.
 C opossums.
 D dogs.
38. The passage states that in the Southern United States, armadillos do damage to:
 E crops.
 G deserts.
 H rivers.
 J houses.
39. The passage indicates that, at birth, armadillos:
 A are utterly helpless.
 B are identical to adults.
 C are able to see.
 D are totally independent.
40. According to the passage, the scientific name *Dasypus novemcinctus* is unique to:
 F the three-banded armadillo.
 G the six-banded armadillo.
 H all armadillos.
 J the nine-banded armadillo.

END OF THE READING TEST.

STOP! IF YOU HAVE TIME LEFT OVER, CHECK YOUR WORK ON THIS SECTION ONLY.

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SCIENCE REASONING TEST

35 Minutes - 40 Questions

DIRECTIONS: This test includes seven passages, each followed by several questions. Read the passage and choose the best answer to each question. After you have selected an answer, fill in the corresponding bubble on your answer sheet. You should refer to the passages as often as necessary when answering the questions. You may NOT use a calculator on this test.

PASSAGE PASSAGE I

Some students formed three studies to measure the average speed on a flat surface of a remote-controlled car. With different wheels, each study was conducted indoors in a temperature-controlled room. A straight track was constructed and measured to be 75 feet long. The car's travel time was measured from start to finish with a stopwatch. The temperature in the room was kept constant at 200 °F and the surface was returned to its original condition after each trial. No modifications were made to the car aside from changing the wheels, and the car's batteries were fully charged before each trial.

Study

Study 1

students ruled the car with hard rubber wheels, which had deep treads and placed it on the surface. One student started the car as another student simultaneously started a stopwatch. The student scanned the stopwatch as the car crossed the 75-foot mark. The students calculated the results of three separate trials and averaged the results (see Table 1).

Table 1		
Trial	Time (s)	Speed (ft/s)
1	22.8	3.28
2	23.2	3.23
3	22.5	3.33
Average:	22.8	3.28

study 2

Study 2

students repeated the procedure used in Study 1, except they ruled the car with son rubber wheels, which were smooth and lacked treads. The results are shown in Table 2.

study 3

Study 3

The students repeated the procedure used in Study 1, but they ruled the car with hard rubber wheels, which had studs unbedded into them instead of treads. The results are shown in Table 3.

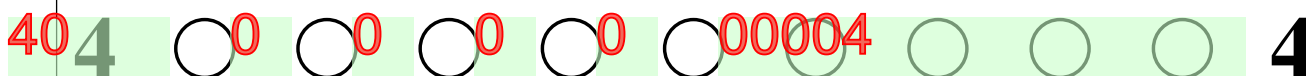
Table 2		
Trial	Time (s)	Speed (ft/s)
1	57	1.31
2	56.4	1.33
3	56.7	1.32
Average:	56.7	1.32

Table 3		
Trial	Time (s)	Speed (ft/s)
1	11.3	6.64
2	11.6	6.47
3	12.1	6.20
Average:	11.7	6.44

I. The fastest times resulted from using which wheels?

- A. Speed remained constant.
- B. Hard rubber wheels with studs imbedded in them.
- C. Son rubber wheels with no treads.
- D. Hard rubber wheels with deep treads.

GO ON TO THE NEXT PAGE.



2. According to Study 1, the average speed for all three trials was:

- E. greater than the speed measured in Trial 3.
- G. less than the speed measured in Trial 1.
- H. greater than the speed measured in Trial 2.
- J. equal to the speed measured in Trial 2.

3. Which of the following statements is best supported by the results of all three studies?

- A. Average speed of a car with deeply treaded hard rubber wheels is approximately $\frac{1}{2}$ the average speed of a car with soft rubber wheels.
- B. The average speed of a car with a studded, hard rubber wheel is approximately $\frac{1}{2}$ the average speed of a car with deeply treaded hard rubber wheels.
- C. Average speed of a car with soft rubber wheels lacking treads is approximately twice the average speed of a car with deeply treaded hard rubber wheels.
- D. The average speed of a car with a studded, hard rubber wheel is approximately twice the average speed of a car with deeply treaded hard rubber wheels.

4. Based on the passage, the higher average speeds were probably the result of:

- F. greater friction.
- G. temperature variations.
- H. too much sunlight.
- J. statistical error.

5. During which of the following was travel time of the car the slowest?

- A. study 2, Trial 1
- B. study 2, Trial 2
- C. study 3, Trial 1
- D. study 1, Trial 2

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PASSAGE II

ninth planet of our solar system. Pluto was discovered in 1930. It is the smallest planet in the solar system, with a surface area more than 30 times smaller than Earth's. Recently, Pluto's categorization as a planet has been debated. Two scientists discuss whether Pluto is a planet or another celestial object.

Scientist 1

Pluto is most certainly a planet. Some astronomers have suggested that Pluto be stripped of its planetary status, arguing that it is more accurately categorized as an asteroid or comet. However, with a 1,413-mile diameter, Pluto is almost times bigger than an average comet, and it does not have a tail of dust and gas as comets do. A planet can be described as a non-moon, sun-orbiting object that does not generate nuclear fission and is large enough to be pulled into a spherical shape by its own gravity. Strictly by definition alone, Pluto is a planet. Pluto is clearly not a moon, as it does not orbit a planet. Although Pluto's orbital path is irregular compared with the other planets of the solar system, it is undisputedly the sun. Pluto does not generate heat by nuclear fission, distinguishing it from a star. It is large enough to be pulled into a spherical shape by its own gravitational force, distinguishing it from either a comet or an asteroid.

Scientist 2

There are many arguments about Pluto suggesting that it is actually not a planet but a member of the Kuiper Belt, a group of sizable comets that orbit the sun beyond Neptune. First, Pluto is composed of icy material, as are comets in the Kuiper Belt. While the planets of the solar system fall into one of two categories: rocky or gaseous. The four inner planets—Mercury, Venus, Earth, and Mars—are rocky; Jupiter, Saturn, Uranus, and Neptune are gaseous. Pluto is neither rocky nor gaseous but has an icy composition. In addition, Pluto is much too small to be a planet. It is less than half the diameter of the next smallest planet, Mercury. The Earth's moon is even larger than Pluto. Finally, the eccentricity of Pluto's orbit indicates that it is not a planet. Pluto is generally considered the ninth planet, but for twenty years of its 249-year orbit, it is actually closer to the sun than Neptune, making it the eighth planet during that period of time. This irregular orbit is shared by over seventy Kuiper Belt comets.

6. Which of the following phrases best describes the major point of difference between the two scientists' viewpoints?

- E. actual location of Pluto in the solar system.
- G. length of Pluto's orbit.
- H. shape of Pluto.
- J. The classification of Pluto as a planet.

7. According to Scientist 2's viewpoint, compared to other planets of the solar system, Pluto's surface is:

- A. less icy.
- B. more icy.
- C. more gaseous.
- D. more rocky.

8. Scientist 1's viewpoint indicates that Pluto differs from asteroids and comets in all of the following ways EXCEPT:

- F. Pluto can generate heat through nuclear fission.
- G. Pluto is pulled into a spherical shape by its own gravitational force.
- H. Asteroids and comets have a tail of gas and dust particles.
- J. Asteroids and comets are much smaller than Pluto.

9. The polar ice caps on Pluto's surface melt during every 249-year orbit, exposing Pluto's truly rocky surface, which is similar to that of Mars. Based on the information provided, this finding, if true, would most likely weaken the position(s) of:

- A. Scientist 1 only.
- B. Scientist 2 only.
- C. both Scientist 1 and Scientist 2.
- D. neither Scientist 1 nor Scientist 2.

10. With which of the following statements would both scientists most likely agree?

- F. Pluto indicates that it could actually be a satellite or another planet.
- G. Pluto should be classified as neither a planet nor a comet; a new category is indicated.
- H. Pluto's surface composition is irrelevant and should not be considered in its classification.
- J. Pluto's erratic orbit differentiates it from all other planets in the solar system.

Scientist 1's viewpoint would be weakened by which of the following observations, if true?

- A. Scientists have recently discovered a Kuiper Belt comet with a radius of almost 500 miles.
- B. Pluto only has one moon, Charon, which is half the size of Pluto.
- C. Planets can be distinguished from comets by the lack of gas and dust particles in the wake of their orbits.
- D. Comets and asteroids are capable of generating nuclear fission.

12. Of the following statements, which best describes how Scientist 2 classifies Pluto?

- F. Neither Pluto nor Kuiper Belt comets have identifiable atmospheres.
- G. Neither Pluto nor Kuiper Belt comets are trailed by a cloud of gas and dust.
- H. Both Pluto and Kuiper Belt comets have similar orbital patterns.
- J. Both Pluto and Kuiper Belt comets are roughly half the size of the next smallest planet, Mercury.

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PASSAGE III

A solute is any substance that is dissolved in another substance. Which is called the solvent.

A student tested the solubility of a substance in six different solvents. The solubility of a substance in a given solvent is defined as the concentration of dissolved solute that is in equilibrium with the solvent.

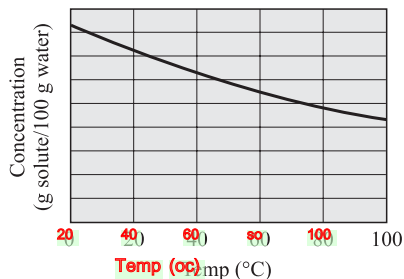
Table 1 represents the concentration of dissolved substances in 100 grams of water at various temperatures. The concentrations are expressed in grams of solute per grams of water.

Table 1						
Concentration of solute (g/100 g H ₂ O)						
Temp (°C)	KCl	NaNO ₃	NaCl	NH ₄ Cl	NaCl	NH ₃
0	28	27	72	82	27	90
20	33	33	86	72	37	55
40	39	31	103	64	46	36
60	45	41	125	55	53	23
80	51	51	148	46	69	14
100	57	57	165	47	77	8

13. According to Table 1, the concentration of which of the following substances varies the least with temperature?

- A. HCl
- B. NH₃
- C. NaCl
- D. KCl

14. The graph below best represents the relationship between concentration and temperature for which of the following substances?



- F. HCl
- G. NaNO₃
- H. NaCl
- J. KCl

15. Data shown in Table 1 support the conclusion that, for a given substance, the temperature of water increases, the amount of solute that can be dissolved:

- A. increases only.
- B. decreases only.
- C. varies, but is a trend depending on the substance.
- D. varies, but with no particular trend.

16. According to Table 1, HCl would most likely have which of the following concentrations at 70°C?

- F. 25.5 g/100 g H₂O
- G. 37.0 g/100 g H₂O
- H. 48.3 g/100 g H₂O
- J. 51.5 g/100 g H₂O

17. A scientist wants to dissolve at least 50 grams of NH₄Cl in 100 g of water in order for the solution to be the proper concentration for use in an experiment. A reasonable minimum temperature for the solution would be:

- A. 25°C
- B. 30°C
- C. 35°C
- D. 50°C

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PASSAGE PASSAGE IV

Salt pans are unusual geologic formations found in deserts. They are formed in endorheic basins, which are lowland areas where water collects but has no outflow. Any rain that falls or any water that is collected in an endorheic basin remains there, except when it is lost to a high concentration of salt and other minerals.

Study

Study 1

Four different salt pans around the world were studied. The volumes of mineral deposits were estimated from the surface areas of the salt pans and the average thickness of the deposits. The ages of the salt pans were also estimated based on the mineral volume. The estimates are shown in Table 1.

Table 1

Salt pan	Estimated mineral volume (km ³)	Estimated age (million years)
A	2,000,000	4.5
B	4,500,000	5.7
C	5,700,000	10.8
D	12,150,000	21.0

study 2

Study 2

The same four salt pans were excavated for fossils. Fossil remnants of extinct plant species were found within each of the salt pans. The ages of the fossils found were similar to the ages of the salt pans (See Table 2). Scientists hypothesize that flooding of salt pan may have led to the extinction of the plant species.

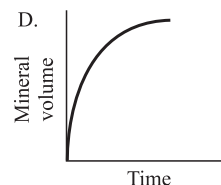
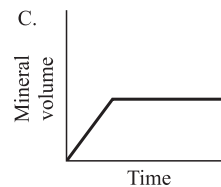
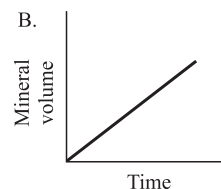
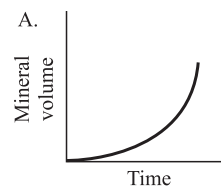
Table 2

Salt pan	Type or name of fossils found	Estimated age of fossils (million years)
Plant species q	species q	4.4
Plant species r	species r	5.5
Plant species s	species s	10.2
Plant species t	species t	19.9

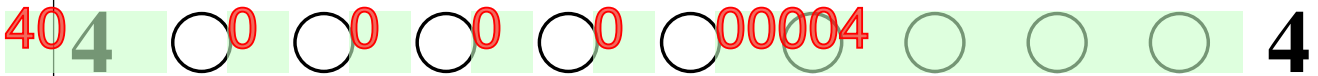
18. Which of the following statements is supported by information in the passage?

- F. Water that has collected in endorheic basins is at least 21.0 million years old.
- G. The age of less-lized plant species cannot be precisely estimated.
- H. More water was collected in and evaporated from older salt pans.
- J. Any end-rheic basin that is less than 2.0 million years Old Contains no fossils.

19. Which one of the graphs represents the relationship between the mineral volume and the age of the salt pans according to Study 1?



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20. Is the conclusion that Salt pan A contains more extinct plant fossils than does Salt pan D supported by information in the passage?
- E. Yes, because Salt pan A is younger than Salt pan D.
 F. Yes, because Salt pan A is older than Salt pan D.
 G. Yes, because the passage suggests that it is easier for plants to grow in areas with a lower mineral volume.
 H. No, because Salt pan D contains a different type of fossilized plant.
 J. NO, because the passage does not include data regarding the quantity of plant fossils found in the salt pans.
21. From the results of Table 1, you could conclude that a salt pan formed more than 21 million years ago would have a mineral value:
- A. between 5,700,000 and 12,150,000 km^3 .
 B. equal to approximately $\frac{1}{2}$ the mineral volume of Salt pan B.
 C. greater than 12,150,000 km^3 .
 D. less than 2,000,000 km^3 .
22. A fossilized plant approximately 9.7 million years old was recently discovered in a salt pan in North America. It was most likely found in a salt pan similar to:
- F. Salt pan A.
 G. Salt pan B.
 H. Salt pan C.
 J. Salt pan D.

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PASSAGE V

Petroleum or crude oil is refined by separating it into different by-products. This process is called *fractional distillation*, whereby crude oil is heated and each different product is distilled, or drawn off, at different stages. Each product is distilled at certain temperature ranges and collected in separate receivers. Petroleum refining is carried out in a boiler and a fractionating tower. Crude oil is super-heated in the boiler to about 700°C. Which vaporizes the crude oil vapors then rise in the tower to certain levels where they cool and condense, according to their chemical structure. When the vapor reaches a height in the tower where the temperature in the column is equal to the boiling point of the substance, the vapor turns into liquid (condenses) in troughs and flows into various tanks for storage, as shown in Figure 1. Table 1 below summarizes the characteristics of the by-products obtained from the fractional distillation of petroleum.

Table 1	
Petroleum by-product	Condensation temperature (°C)
Petroleum gas	20–40
Gasoline	40–70
Kerosene	100–120
Gas oil	120–200
Lubricating oil stocks	200–300
Residue	600

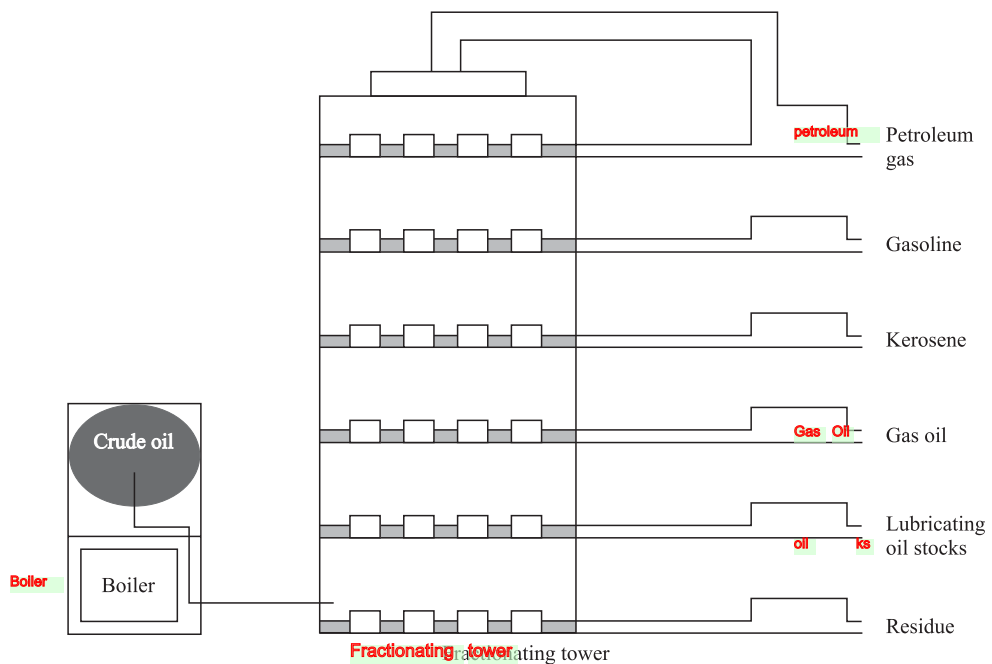


Figure 1

23. According to the passage, the temperature at which gasoline condenses is most likely:
- less than 0°C.
 - less than 40°C.
 - greater than 200°C.
 - greater than 700°C.

24. According to the passage, which by-product formed first in the fractionating tower condenses first?
- Petroleum gas
 - Kerosene
 - Gas oil
 - Residue

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25. According to Figure 1, fractional distillation uses which of the following as a raw material?

- A. Gasoline
- B. Residue
- C. crude oil
- D. Gas oil

26. Given that naphtha, another by-product of petroleum distillation, has a condensation point of approximately 90°C, which two petroleum by-products would this substance be found in a fractionating tower?

- E. Gasoline and kerosene
- G. Lubricating oil stocks and gas oil
- H. Kerosene and gas oil
- J. Residue and lubricating oil stocks

27. According to the passage, at what temperature is most of the crude oil vaporized?

- A. 600°C
- B. 300°C
- C. 100°C
- D. 20°C

28. According to the passage, as vapor rises in the fractionating tower:

- F. condensation temperature increases only.
- G. the condensation temperature decreases only.
- H. the condensation temperature increases quickly, then slowly decreases.
- J. condensation temperature remains stable at 600°C.

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PASSAGE VI

Scientists theorize that the release of X-rays by distant stars and the amount of distortion or "bending" the X-rays endure as they travel out of the solar system can help indicate the presence of planets orbiting these stars. The distortion of the X-rays would be caused by the gravitational pull exerted by the planets. Specifically, "bending" in the X-rays would indicate the presence of planets, while a low level of bending would most likely signify the presence of smaller planets.

In addition to determining whether or not there are planets circling a distant star, the amount of X-ray distortion can determine the planets' orbital pattern. A circular orbit produces increasing or decreasing distortions at the same level. For instance, if a star's X-rays are 2 meters the first day, 2 meters the fourth day, 4 meters the seventh day, and so on, it indicates a circular orbit. See Figure 1. If, however, the pattern of bending is random, as in a bending of 5 meters the first day, 3 meters the second day, 0 meters the third day, and 7 meters the fourth day, then the planet's orbit is elliptical. See Figure 2. Further, if the paths of the X-rays are not bent in any way, it is assumed that the star has no planets.

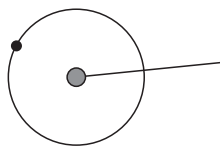


Figure 1 Circular orbit

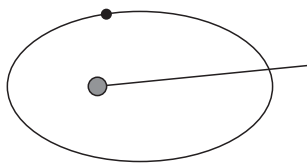


Figure 2 Elliptical orbit

Table 1 shows the amount of distortion of X-rays released by 4 different stars over a period of 10 days.

Table 1					
		X-ray distortion (m)			
		Day 1	Day 4	Day 7	Day 10
Star 1	Star 1	0.00	1.00	2.50	3.25
	Star 2	0.00	0.00	0.00	0.00
	Star 3	4.00	4.00	2.00	1.00
	Star 4	0.10	0.10	0.11	0.11

Note: Assume that there are no other objects that affect the X-rays.

29. According to Table 1, which star most likely has no planets?

A. Star 1
B. Star 2
C. Star 3
D. Star 4

30. Based on information in the passage, how many of the stars listed in Table 1 have at least one planet with a circular orbit?

F. 0
G. 2
H. 3
J. 4

31. Which of the following statements is best supported by information in the passage?

A. Star 3 is likely orbited by at least one large planet.
B. Star 4 has a circular orbit.
C. Star 1 has an elliptical orbit.
D. Star 2 is likely orbited by several small planets.

32. If X-ray distortion were observed for an additional three days, one could predict that the path of the X-rays produced by Star 1 on day 13 would be distorted by:

F. 0.75 meters.
G. 1.00 meter.
H. 3.75 meters.
J. 4.00 meters.

33. According to information in the passage, which of the following assumptions could be true?

A. X-rays are affected by certain physical forces.
B. X-rays are simply bits of energy and are therefore, unaffected by physical forces.
C. Planets with elliptical orbits are more common than planets with circular orbits.
D. The presence of planets orbiting a star can only be detected using X-ray distortion.

34. Based on information in the passage, which of the following stars most likely has at least one planet with an elliptical orbit?

F. Star 2 only
G. Star 4 only
H. Stars 1 and 3 only
J. Stars 1, 3, and 4 only

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PASSAGE VII

Bacteria are categorized by how they respond, as indicated by reproduction and growth, to certain temperatures. They are grouped into four categories: psychrophiles, psychrotrophs, mesophiles, and thermophiles. Minimal growth temperature is the lowest point at which the bacteria will reproduce. Optimum growth temperature is the temperature at which the bacteria reproduce most efficiently. Maximum growth temperature is the highest temperature to which the bacteria will respond, and which the bacteria will not reproduce at all. Table 1 lists the types of bacteria as well as the growth points for each.

Table 2 represents a list of common bacteria and their growth points.

Table 1				
Growth points or ranges (°C)				
Classifications	Minimum	Optimum	Maximum	
Psychrophile	below 10	15	below 20	
psychrotroph	0–5	15	30	
Mesophile	5–25	35	30–50	
Thermophile	25–45	60–60	60–90	

Table 2				
Cardinal growth points (°C)				
Bacteria name	Minimum	Optimum	Maximum	
Anoxybacillus flavithermus	30	60	72	
Bacillus flavothermus	30	60	72	
Clostridium perfringens	15	45	50	
Escherichia coli	10	37	45	
Listeria monocytogenes	1	34	45	
Micrococcus cryophilus	0	15	30	
Staphylococcus aureus	10	37	45	
Streptococcus pyogenes	20	37	40	
Streptococcus pneumoniae	25	37	42	

35. The category of bacteria appearing most frequently in Table 2 is:
- psychrophile.
 - psychrotroph.
 - mesophile.
 - thermophile.

36. The type of bacteria found in Table 2 that does not fit exactly into any of the categories listed in Table 1 is:
- Clostridium perfringens.
 - Listeria monocytogenes.
 - Micrococcus cryophilus.
 - Streptococcus pneumoniae.

37. Average human body temperature is 40°C. According to Table 2, Which of the following bacteria would grow most successfully in the human body?
- Anoxybacillus flavithermus.
 - Clostridium perfringens.
 - Escherichia coli.
 - Listeria monocytogenes.

38. A new bacteria was discovered. It reproduces best at temperatures above 65°C. This bacteria can most likely be categorized as a:
- psychrophile.
 - psychrotroph.
 - mesophile.
 - thermophile.

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39. On the information in Table 2, which bacteria has the smallest growth range?
- Listeria monocytogenes*.
 - Micrococcus cryophilus*.
 - Streptococcus pneumoniae*.
 - Streptococcus pyogenes*.
40. According to information provided in the passage, *Listeria monocytogenes* stop reproducing at what temperature?
- 310°C, but <10°C
 - >10°C, but <34°C
 - >340°C, but <450°C
 - 3450°C, but >45°C

END OF THE SCIENCE REASONING TEST.

STOP! IF YOU HAVE TIME LEFT OVER, CHECK YOUR WORK ON THIS SECTION ONLY.

WRITING TEST PROMPT

DIRECTIONS: This test is designed to assess your writing skills. You have 30 minutes to plan and write an essay based on the stimulus provided. Be sure to take a position on the issue and support your position using logical reasoning and relevant examples. Organize your ideas in a focused and logical way, and use the English language to clearly and effectively express your position.

When you have finished writing, refer to the Scoring Rubrics discussed in the Introduction (page 4) to estimate your score.

Foreign-language instruction is declining in public high schools in the United States. Some people think this reflects the rise of English as the accepted language of commerce around the world, and that knowledge of foreign languages is of lessening importance. Other people see the reduction in language study as a sign of the United States' failure to integrate with the rest of the world and a threat to the nation's vitality in an increasingly cross-cultural marketplace.

In your opinion, should greater support be given to foreign language programs in high schools in the United States?

In your essay, take a position on this question. You may write about one of the points of view mentioned above, or you may give another point of view on this issue. Use specific examples and reasons for your position.

ANSWER KEY

English Test

1. B	21. A	41. B	41. B	61. D	61. D
2. G	22. F	42. H	42. H	62. G	62. G
3. C	23. D		43. A	63. A	63. A
4. J	24. F	44. J	44. J	64. J	64. J
5. A	25. B	45. c	45. C	65. c	65. C
6. G	26. F	46. J	46. J	66. J	66. J
7. B	27. D	47. A	47. A	67. B	67. B
8. J	28. G	48. G	48. G	68. J	68. J
9. B	29. A		49. A	69. B	69. B
10. F	30. F	50. H	50. H	70. F	70. F
11. D	31. D		51. A	71. D	71. D
12. J	32. F	52. H	52. H	72. G	72. G
	33. A	53. D	53. D	73. D	73. D
14. G	34. H	54. H	54. H	74. H	74. H
15. c	35. A	55. A	55. A	75. A	75. A
16. G	36. F	56. J	56. J		
17. A	37. A	57. B	57. B		
18. J	38. J	58. F	58. F		
19. B	39. D		59. A		
20. F	40. F	60. J	60. J		

Mathematics Test

1. C	21. A	41. D	41. D
2. J	22. H	42. G	42. G
3. C	23. E	43. A	43. A
4. G	24. J	44. F	44. F
5. B	25. c	45. D	45. D
6. H	26. K	46. G	46. G
7. C	27. c	47. D	47. D
8. G	28. G	48. F	48. F
9. B	29. A	49. D	49. D
10. J	30. H	50. J	50. J
11. c	31. D	51. E	51. E
12. F	32. K	52. H	52. H
13. D	33. D	53. D	53. D
14. G	34. F	54. G	54. G
15. B	35. B	55. E	55. E
16. G	36. J	56. K	56. K
17. E	37. E	57. D	57. D
18. J	38. G	58. F	58. F
19. c	39. c	59. B	59. B
20. F	40. H	60. H	60. H

Reading Test

1. B	21. B	21. B
2. F	22. H	22. H
3. C	23. A	23. A
4. F	24. H	24. H
5. D	25. D	25. D
6. H	26. H	26. H
7. A	27. A	27. A
8. G	28. J	28. J
9. A	29. D	29. D
10. J	30. G	30. G
11. B	31. A	31. A
12. G	32. J	32. J
13. D	33. D	33. D
14. F	34. G	34. G
15. c	35. c	35. C
16. F	36. H	36. H
17. c	37. B	37. B
18. G	38. F	38. F
19. D	39. c	39. C
20. J	40. J	40. J

Science Reasoning Test

1. B	21. C	21. C
2. H	22. H	22. H
3. D	23. c	23. C
4. F	24. J	24. J
5. A	25. c	25. C
6. J	26. F	26. F
7. B		27. A
8. F	28. G	28. G
9. B	29. B	29. B
10. J	30. G	30. G
11. A	31. A	31. A
12. H	32. J	32. J
13. c	33. A	33. A
14. F	34. G	34. G
15. c	35. c	35. C
16. J	36. G	36. G
17. D	37. c	37. C
18. H	38. J	38. J
19. B	39. c	39. C
20. J	40. J	40. J

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SCORING GUIDE

Your final reported score is your **COMPOSITE SCORE**. Your **COMPOSITE SCORE** is the average of all of your **SCALE SCORES**.

Your **SCALE SCORES** for the four multiple-choice sections are derived from the Scoring Table on the next page. Use your **RAW SCORE**, or the number or questions that you answered correctly for each section, to determine your **SCALE SCORE**. If you got a **RAW SCORE** of 60 on the English test, for example, you correctly answered 60 out of 75 questions.

Step 1 Determine your **RAW SCORE** for each of the four multiple-choice sections:

- English _____
- Mathematics _____
- Reading _____
- Science Reasoning _____

The following Raw Score Table shows the total possible points for each section.

RAW SCORE TABLE		
KNOWLEDGE AND SKILL AREAS	RAW SCORES	RAW SCORES
ENGLISH	ENGLISH	75
	MATHEMATICS	60
READING	READING	40
SCIENCE	REASONING	40
	WRITING	12

Multiple-Choice Scoring Worksheet

Step 2 Determine your **SCALE SCORE** for each of the four multiple-choice sections using the following Scoring Worksheet. Each **SCALE SCORE** should be rounded to the nearest number according to normal rules. For example, 31.2, 31.31 and 31.51 round to 31. If you answered 61 questions correctly on the English section, for example, your **SCALE SCORE** would be 29.

$$\text{English} \quad \frac{\text{RAW SCORE}}{\text{RAW SCORE}} \times 36 = \frac{\text{RAW SCORE}}{\text{RAW SCORE}} \div 75 = \frac{\text{RAW SCORE}}{\text{RAW SCORE}} - 2 \quad (*\text{correction factor})$$

SCALE SCORE

$$\text{Mathematics} \quad \frac{\text{RAW SCORE}}{\text{RAW SCORE}} \times 36 = \frac{\text{RAW SCORE}}{\text{RAW SCORE}} \div 60 = \frac{\text{RAW SCORE}}{\text{RAW SCORE}} \quad (*\text{correction factor})$$

SCALE SCORE

$$\text{Reading} \quad \frac{\text{RAW SCORE}}{\text{RAW SCORE}} \times 36 = \frac{\text{RAW SCORE}}{\text{RAW SCORE}} \div 40 = \frac{\text{RAW SCORE}}{\text{RAW SCORE}} + \text{correction factor})$$

SCALE SCORE

$$\text{Science Reasoning} \quad \frac{\text{RAW SCORE}}{\text{RAW SCORE}} \times 36 = \frac{\text{RAW SCORE}}{\text{RAW SCORE}} \div 40 = \frac{\text{RAW SCORE}}{\text{RAW SCORE}} + 1.5 \quad (*\text{correction factor})$$

SCALE SCORE

*The correction factor is an approximation based on the average from several ACT tests. It is most valid for scores in the middle (approximately 16–24 scale composite score) of the scoring range. The scores are all approximate. Actual ACT scoring scales vary from one administration to the next based upon several factors.

If you take the optional Writing Test, you will need to combine your English and Writing scores to obtain your final **COMPOSITE SCORE**. Once you have determined a score for your essay out of 12 possible points, you will need to determine your **ENGLISH/WRITING SCALE SCORE** using both your **ENGLISH SCALE SCORE** and your **WRITING TEST SCORE**. The combination of the two scores will give you an **ENGLISH/WRITING SCALE SCORE**, from 1 to 36, that will be used to determine your **COMPOSITE SCORE** mentioned earlier.

Using the English/Writing Scoring Table, find your **ENGLISH SCALE SCORE** on the left or right hand side of the table and your **WRITING TEST SCORE** on the top of the table. Follow your **ENGLISH SCALE SCORE** over and your **WRITING TEST SCORE** down until the two columns meet at a number. This number is your **ENGLISH/WRITING SCALE SCORE** and will be used to determine your **COMPOSITE SCORE**.

Step 3 Determine your **ENGLISH/WRITING SCALE SCORE** using the English/Writing Scoring Table on the following page:

English _____

Writing _____

English/Writing _____

ENGLISH WRITING SCORING TABLE

ENGLISH	ENGLISH	WRITING TEST SCORE											ENGLISH	ENGLISH
	SCALE SCORE	2	3	4	5	6	7	8	9	10	11	12	SCALE	SCALE SCORE
	36	26	28	29	30	30	31	32	33	34	32	36		36
	35	27	27	28	30	31	31	32	33	33	34	35		35
	34	26	27	28	29	30	31	32	33	34	34	35		34
	33	25	26	27	28	29	30	31	32	33	34	34		33
	32	25	25	26	27	28	29	30	30	32	33	33		32
	31	24	25	26	27	28	29	30	30	30	31	32		31
	30	23	24	25	26	27	28	29	30	30	31	32		30
	29	22	23	24	25	26	27	27	29	30	31	31		29
	28	22	23	24	24	25	26	27	28	28	29	30		28
	27	21	22	23	24	25	26	27	28	28	28	29		27
	26	20	21	22	23	24	25	26	27	27	28	29		26
	25	19	20	21	22	23	24	25	26	27	28	28		25
	24	19	20	20	21	22	23	23	24	25	26	27		24
	23	17	19	20	20	21	22	23	24	25	26	27		23
	22	16	17	19	20	20	21	22	23	24	25	26		22
	21	16	17	17	19	20	20	21	22	23	24	25		21
	20	15	16	17	19	20	21	21	22	23	24	24		20
	19	14	15	16	17	19	20	21	22	23	24	24		19
	18	13	14	15	16	17	19	20	21	22	23	23		18
	17	13	14	15	16	16	17	19	20	20	21	22		17
	16	12	13	14	15	16	17	19	20	20	21	21		16
	15	11	12	13	14	15	16	17	18	20	21	21		15
	14	10	11	12	13	14	15	16	17	19	20	20		14
	13	10	11	12	13	14	14	15	16	17	18	19		13
	12	9	10	11	12	13	14	15	16	17	18	19		12
	11	8	9	10	11	12	13	14	15	16	17	18		11
	10	8	9	9	10	11	12	13	14	15	16	17		10
	9	7	8	9	10	11	12	13	13	14	15	16		9
	8	6	7	8	9	10	11	12	13	14	15	16		8
	7	5	6	7	8	9	10	11	12	13	14	15		7
	6	5	6	7	7	8	9	10	11	12	13	14		6
	5	4	5	6	7	8	9	10	11	12	12	13		5
	4	3	4	5	6	7	8	9	10	11	12	13		4
	3	2	3	4	5	6	7	8	9	10	11	12		3
	2	2	3	4	5	6	6	7	8	9	10	11		2
	1	1	2	3	4	5	6	7	8	9	10	11		1

Step 4 Determine your **COMPOSITE SCORE** by finding the sum of all your **SCALE SCORES** for each of the four sections: **English only** (if you do not choose to take the optional **Writing Test**) or **English/Writing** (if you choose to take the optional **Writing Test**), **Math**, **Reading**, and **Science Reasoning**, and divide by 4 to find the average. Round your **COMPOSITE SCORE** according to normal rules. For example, 31.2 \approx 31 and 31.5 \approx 32.

$$\begin{array}{ccccccc}
 \underline{\hspace{2cm}} & + & \underline{\hspace{2cm}} & + & \underline{\hspace{2cm}} & + & \underline{\hspace{2cm}} & = & \underline{\hspace{2cm}} \\
 \text{ENGLISH ONLY OR} & & \text{MATHEMATICS} & & \text{READING} & & \text{SCIENCE} & & \text{SCALE SCORE TOTAL} \\
 \text{ENGLISH/Writing} & & \text{SCALE SCORE} & & \text{SCALE SCORE} & & \text{SCALE SCORE} & & \\
 \text{SCALE SCORE} & & & & & & & & \\
 \end{array}$$

$$\begin{array}{ccc}
 \underline{\hspace{2cm}} & 4 \div 4 = & \underline{\hspace{2cm}} \\
 \text{SCALE SCORE TOTAL} & & \text{COMPOSITE SCORE}
 \end{array}$$

ANSWERS AND EXPLANATIONS

English Test Explanations

PASSAGE PASSAGE I

1. The best answer is B. In this sentence, the word "obsessed" is most appropriate to describe the action taking place. The word "obsessive" can be used as an adjective. The participle "Obsessing" is not appropriate, and "obsessioned" is not a word, so answer choices C and D can be eliminated.
2. The best answer is G. Answer choice G is the most clear and concise because it simply uses the verb "pay." As it is written, the sentence is wordy and redundant. Answer choice H, "paying money," sounds awkward and is grammatically incorrect in conjunction with the phrase that precedes it, "is willing to." Answer choice J is written in the past tense. While the rest of the sentence is written in the present tense and, therefore, must be eliminated.
3. The best answer is C. Answer choice C is grammatically correct and makes sense idiomatically. Answer choices A and B indicate that natural red heads actually want to possess brunettes, which does not make sense. Answer choice D does not make sense and is not correct for standard written English.
4. The best answer is A. The first part of the sentence and the second part of the sentence are independent clauses that refer to different hairstyles. Answer choice J, "and," makes "most sense here. Answer choice C, "however," requires punctuation to fit in the sentence (normally between commas). Answer choice F implies that teenagers enjoy experimenting with their hair as a result of men and women cringing at the sight of gray hair. Answer choices G and H imply that the two phrases negate each other.
5. The best answer is A. The correct preposition to use here is "of." The phrase "result of" is idiomatic.
6. The best answer is G. This answer choice correctly precedes the verb "mixing" with its modifier "rapidly."
7. The best answer is B. The sentence does not have a natural pause at this point in the sentence, so a comma is inappropriate. In addition, you can eliminate answer choices A and D. A colon should be used after a complete statement to introduce directly related information, such as a list or an example, so answer choice C should be eliminated.
8. The best answer is I. The word "was" makes the most sense in the sentence because it clearly and simply indicates the past tense. The phrase "could have" can never be correct. "Could have been" is not appropriate in standard written English. Some people incorrectly use "Of when they should use "could've," which is the contraction of "could have."
9. The best answer is B. This sentence is composed of a main clause ("The monthly highlighting went well") followed by a subordinator ("except for"), then an extended noun phrase ("those times when my hair turned out a little too subdued, making me look partially gray instead of brunette"). Especially as it is preceded by a subordinator, such a lengthy component of a sentence calls to be offset by a comma.
10. The best answer is F. The sentence as it is written makes the most sense in context. It sufficiently indicates that, despite some setbacks, the author's experience with highlights has been mostly positive. Answer choice G implies that the author was making some sort of list regarding her and her feelings towards her highlights. Answer choice H indicates some sort of contrast that is simply not present in the paragraph. Answer choice J suggests that the hairdresser's mistakes pleased the author.
11. The best answer is D. Sentence 5 follows from the information in Sentence 3. Likewise, Sentence 4 relies on Sentence 5 and also creates a good transition into the next paragraph.
12. The best answer is J. To maintain parallel tense in the sentence, since Donna "was" surprised at the author's request, the simple past tense or the verb "gather" also needs to be used. The sentence is written in the present tense, therefore the answer choice F can be eliminated. Answer choices G and H are not in the parallel tense.
13. The best answer is A. The coordinating conjunction "and" is the most concise choice; it joins two functionally parallel elements within the

sentence here, two nouns, "tears" and "laughter." The phrases "along with" and "as well as" serve a similar function to the coordinating conjunction "and," but they are awkward and neither clear nor concise. Answer choice C is incorrect because "or" does not make sense in this context with "seesawing."

14. The best answer is G. Since the preceding sentence does not summarize the essay or relate to the introduction, answer choices F and H can be eliminated. This sentence is specifically about the narrator ceasing her crying, which is not the purpose of the essay. Eliminate answer choice J. The realization of her vanity puts her situation in perspective; therefore, answer choice G is the best answer.

15. The best answer is C. The passage simply discusses the narrator's anxieties in dyeing her own hair. It is unlikely that the author's decision to change her hair color would ease the apprehension of others who were considering dyeing their hair. The fact that dyeing her hair gave her a bald spot would probably deepen the fears of those who were feeling anxious about dyeing their hair. Eliminate answer choice A. Answer choice B can also be eliminated; the passage only discusses the author and other "mature" women dyeing their hair. Answer choice D is incorrect because the passage as a whole is neutral and does not attempt to influence people regarding changing hair color.

PASSAGE II

16. The best answer is G. Answer choice G is a common phrase and sounds the best in the context of this sentence. It is appropriate to "American" as an adjective to describe the noun "heritage." The other answer choices are grammatically incorrect. Also, answer choice J suggests that the "heritage" belongs to only one "American," which does not fit the context of the paragraph.
17. The best answer is A. To state that Walker Lee "still practices" is clear and concise. Answer choices B and C are wordy and redundant in saying that "still continues to practice" and "continues to still practice." Answer choice D is awkward.
18. The best answer is J. This passage is written in the past tense. "Began" is the simple past form of the verb "begin," therefore, answer choice J is correct. Answer choice F is written in the past perfect tense and therefore does not maintain the

parallel between verbs. Answer choices G and H use "Ex-gin," the past participle of "begin," and can therefore be eliminated.

19. The best answer is B. The phrase "that Faerington" does not make sense. The rest of the answer choices correctly use parentheses or commas in setting off their respective appositive phrases.
20. The best answer is F. The word "lugging" is the most descriptive word. It signifies carrying or pulling something heavy. None of the other answer choices addresses the effort it took to move the anvil from Pennsylvania to Michigan.
21. The best answer is A. The phrase "get started" in answer choice A clearly indicates that Lee was just beginning his career in blacksmithing. The other answer choices suggest that his career had already started.
22. The best answer is F. In the context of the sentence, "its" is the possessive form; therefore, no apostrophe is necessary. "It's" means "it is." "Its'" (note the apostrophe at the end) does not exist in English because "it" is a singular pronoun.
23. The best answer is D. Omitting the underlined portion of the sentence is the best choice in this instance. In any form, the information provided in this sentence is distractive, not related to the main topic of the essay—and is therefore unnecessary.
24. The best answer is F. Answer choice F provides a logical and relevant introduction to the topic or the paragraph. Answer choice H is incorrect because the paragraphs preceding and following this sentence have nothing to do with moving equipment. Answer choices G and J can be eliminated because neither has anything to do with the construction of Lee's first blacksmith shop, the subject of the paragraph.
25. The best answer is B. This answer choice is correct because it is the only one that is grammatically proper and makes sense. Answer choice A does not make sense because "but" is used to introduce a contradictory element; a "crude" structure is not "only nine years" old; it appears to be instead a correlational relationship. Answer choice C is ungrammatical and D violates agreement with "was." "was."
26. The best answer is F. Two adjectives modify a noun in the same way; they must either be separated by a comma or joined with the word "and" with no comma.

27. The best answer is D. The phrase "at a family event" is a descriptive phrase that must be set off by commas. Answer choice C is incorrect because subject and verb must not be separated by a comma. Similarly, in B, a comma makes an incorrect division of a compound.
28. The best answer is G. The act of proclaiming took place during the event, so it is a completed action and should be in the past tense.
29. The best answer is A. The information given in Sentence 2 merely describes the knife from the preceding sentence and has nothing to do with the creation of Lee's first object.
30. The best answer is E. No specific person or point in time is mentioned, and the remainder of the sentence is written in the present tense. Thus, the present tense of the verb "watch" must be used.

PASSAGE PASSAGE III

31. The best answer is D. Using the past tense verb "told" makes the most sense because the narrator is recalling what happened when she heard the story.
32. The best answer is F. Answer choice F correctly places a comma following the clause that begins with the subordinate "As," which describes what happened that caused the narrator's eyes to pop out of her head and her jaw to drop. Answer choice G creates a run-on sentence. Answer choices H and J incorrectly place commas following the word "could," which creates awkward and ungrammatical sentences.
33. The best answer is A. An easy way to figure out the answer to this question is to look at the preceding sentence. In that sentence, the narrator says, "I could." To maintain verb parallelism in the paragraph, the phrase "I could" should be repeated.
34. The best answer is H. In this sentence, the word "that" is unnecessary because the nonclausal clause-introducing function of the word "that" is satisfied by "how." Answer choice G is wrong because "because" does not make sense after "about." Answer choice J lacks a clause-introducer.
35. The best answer is A. This question tests your ability to maintain parallel structure in a sentence. Each verb in the sequence of events is written in the past tense. Since the sister's husband "threw back the bedcovers" and "began heating the dreaded

thing With a broom," he would have to have "flushed it down the toilet."

36. The best answer is F. This part of the sentence requires a verb, so you can eliminate answer choice J. The adjective "deadly" is used to describe the scorpions, so the word "deadlier" is used, the word "more" cannot precede it; therefore, answer choice G can be eliminated. The comma before "and" indicates the phrase preceding it must be an independent clause, meaning one that contains a verb phrase that could stand alone in a sentence. The gerund ("ing") form violates this test.
37. The best answer is A. This answer choice gives a logical explanation for why Diana would not seek professional help as the condition of her arm continued to worsen. The remaining choices are not supported by the context.
38. The best answer is J. This question tests your ability to express yourself clearly and simply. Because the sentence states that scorpions will sting anyone they accidentally encounter, using the word "inadvertently" would be redundant and unnecessary. The word "crawl" is the clearest and most concise choice.
39. The best answer is D. This question tests your ability to accurately create the possessive form of words. In this case, the narrator is talking about the homes of many scorpions, instead of the home of one specific scorpion. The plural possessive form of scorpion, "scorpions'," must be used. To make a plural possessive, you must place an apostrophe after the pluralizing "s."
40. The best answer is F. Answer choice G is awkward because its components are not written in logical order. Answer choice H places an unnecessary comma after the word "species." Answer choice J is ambiguous as to whether the "ninety species" in question constitute all the world's scorpions or just those native to the United States.
41. The best answer is B. In this part of the sentence, the word "which" introduces a clause descriptive of the noun that precedes it, "the Bark Scorpion."
42. The best answer is H. This question tests your ability to discern which details are important to the subject of an essay. In this case, the author previously mentioned that scorpions can be found in the home, and it is obvious that they still live outside. The underlined portion reinforces the notion that scorpions can be found both inside the home and outside the home.

43. The best answer is A. This sentence follows a standard verb pattern for hypothetical situations. Examine the clause in simple present tense, which precedes a clause in the imperative (command) form. For example, "If you swim today, apply sunscreen."
44. The best answer is J. This question requires you to put things in logical order and to decide whether the underlined portion is relevant to the paragraph. In this case, it is best to omit the underlined portion because it not only adds no needed information to the paragraph, it is an irrelevant detail. The rest of the sentences are already in the most logical order.
45. The best answer is C. Answer choices A and B can be eliminated immediately because the simple answer to the question is no. This essay does not provide professional advice on the treatment of scorpion stings. The essay is merely a recollection of a time when the narrator's sister was stung by a scorpion and the narrator is offering advice based solely on personal experience and opinion.

PASSAGE IV

46. The best answer is J. Answer choice F is incorrect because it should only be used to place special emphasis on a certain word or phrase in a sentence, which is unnecessary here. Answer choice G is incorrect because the preceding phrase is not an independent clause, thus must not be separated by a semicolon. Answer choice H is incorrect because it creates a run-on sentence. Answer choice J correctly identifies the fact that the word "if" begins a clause that must be separated from the rest of the sentence by a comma wherever the clause ends. In this case, the clause clearly begins with repetition of the subject "you."
47. The best answer is A. This is the most clear and concise answer choice. The others are awkward. Answer choice C is incorrect because "always" modifies "company" and must, in this case, precede it. Answer choice D does not include the word "always," which causes the sentence to lose a key detail.
48. The best answer is G. "Non-compliance" describes the wrong each side feels the other committed, thus the lawsuits assert "non-compliance on both sides." This eliminates all answer choices except answer choice G.
49. The best answer is A. Answer choice B uses an unnecessary comma. Answer choices C and D can be eliminated because they are incorrect as idiomatic phrases.
50. The best answer is H. In this case, the word "promised" is used as an adjective. Answer choices F and G can be eliminated. Answer choice J is an adjective, but the definitions of "promised" and "promising" differ. "reward was assured, or promised to Helga. He was not likely to develop nor did it show potential, both aspects of the definition of "promising," thus answer choice C can be eliminated.
51. The best answer is A. Answer choice B creates an incomplete sentence, so it can be eliminated. Since the action was continuously occurring in the past, you would say that she "had been living."
52. The best answer is H. Answer choice J can be eliminated because the underlined portion is preceded by the article "the." The article "the" must precede the word "greatest." Since "reward" serves correctly as a noun in this sentence, answer choices F and G can be eliminated. A "great reward," answer choice H, is the best and most reasonable choice.
53. The best answer is D. Sentence 1 explains how Helga became interested in the contest, so it must be first. This eliminates answer choice C. It makes sense that the requirements would be listed next and that the comments about the bicycle Skirl would follow. The last sentence, sentence 4, explains why Helga decided to make the journey despite the embarrassment of wearing a bicycle skirt.
54. The best answer is H. The actions of Helga and her daughter should be written in the simple past tense in order to maintain verb parallelism throughout the paragraph. Answer choice I is in the past tense, but it is wordy. "Have," in any form, is not necessary to this phrase.
55. The best answer is A. This answer choice is the clearest and most concise. The other choices are wordy and awkward.
56. The best answer is J. "Nowhere to be found" is a common idiomatic phrase making it the most clear and concise choice. The other answer choices are awkward.
57. The best answer is B. Answer choice A indicates that the following sentence is a result or what comes before. In this case, the phrases are not causally connected, so answer choice A is incorrect. Answer choice C is awkward and answer choice D is wordy. The phrase "in fact" is not necessary to

this passage. Answer choice B is the clearest and most concise choice.

58. The best answer is F. The words "leaving 'only' begin a descriptive clause, which must be set off by a comma. Answer choice G creates a run-on sentence. Semicolons must be used to separate two independent clauses; therefore, answer choice H is incorrect. Answer choice J uses a comma incorrectly separating "only" from the phrase it modifies.

59. The best answer is A. Answer choice A gives a specific reason as to what Helga intended to use the \$10,000 prize for: the passage clearly states that without this prize money, the family would race foreclosure. Answer choice B simply restates the fact that Helen wanted the \$10,000 she would win if she completed the cross-country walk, but does not explain what she would use the money for. Answer choice C is incorrect because no logical connection between the prize money and the children's diphtheria is made in the passage. Answer choice D is outside the scope of the passage as well; there is no mention of Clara gaining experience anywhere in the passage.

60. The best answer is J. Answer choices F and G are incorrect because the writer should not make this addition to the passage; it is irrelevant. Answer choice H identifies an unimportant detail. Of the great-grandson's story as the reason the sentence does not belong.

PASSAGE V

61. The best answer is D. Appositives, like "particularly via airplane," must be separated from the sentence by commas. They are easily identified because they can be omitted from the sentence without rendering the sentence ungrammatical.

62. The best answer is G. Because the author wishes to add more detail, the best answer choice will be the one that includes the most descriptive language. Answer G is the best alternative because it includes the explanatory detail "also known as jet lag" and correctly sets it apart with commas.

63. The best answer is A. The sentence identifies jet lag as a "sleeping disorder," but the word "although" indicates that what follows are mitigating factors. First, jet lag is a "temporary condition" and second, jet lag is "not as serious" as other sleeping disorders. Answer choice B appears to delineate correctly the lack of seriousness, but is missing the critical first "as" to make a comparison.

The best answer is J. Before a term is defined, its relevance to the passage must be stated. Furthermore, among the other answer choices, circadian rhythms are not specifically mentioned.

65. The best answer is C. While the sentence as it is written may be grammatical, its use of punctuation is excessive. Answer choice C provides a fluid, concise transition to the details of the human "sleeping and waking" cycle.

66. The best answer is J. This sentence elaborates on the statement in the previous sentence by citing an example. It does not provide supplementary (Answer choice F: "in addition"), parallel (G: "Likewise"), or opposing (H: "Instead") evidence.

67. The best answer is B. It is appropriate to use the plural possessive pronoun "our" when referring to the inner clocks of human beings.

68. The best answer is J. The sentence introduces a factor adversely affecting circadian rhythms, which does not require additional transition words. Answer choices F and H create incomplete sentences.

69. The best answer is B. "Well-tuned" stands by itself as a satisfactory idiomatic expression meaning "optimized." Introducing "high" or "highly" makes the sentence unnecessarily wordy.

70. The best answer is F. Answer choices G and H may be eliminated for their wordiness. Answer choice J may be eliminated because it makes too strong an assertion about the link between long air travel and headaches. Answer choice F correctly uses "Often" to define the frequency of passengers' headaches.

71. The best answer is D. As it is written in the passage, this verb phrase is wordy, as it is written in passive voice ("being"). This same principle eliminates answer choice B. Answer choice C may be eliminated for its unnecessary use of commas.

72. The best answer is G. When adjectives modify a noun in a similar way, they are separated from each other with commas or "and," just as in a list. There must be a comma between "dry" and "pressurized." It is not necessary to include a comma after "pressurized," because it is followed directly by the noun that is being modified (atmosphere).

73. The best answer is D. Using a comma to join independent clauses creates a comma splice. The other

Choices present several acceptable ways to separate independent clauses.

74. The best answer is H. This answer choice mentions the body's "new environment." Logical places for the sentence, thus, would be after the technique cited for acclimating to eastbound travel (before Sentence 4) and after the technique cited for acclimating to westbound travel (after Sentence 5).

Choice H corresponds to the latter location, "before Sentence 6."

75. The best answer is A. This sentence would provide a reason why understanding ways to connect jet lag—which is the focus of the essay—is important. It follows that the sentence would be placed after the assertion that jet lag is considered a minor sleep disorder.

Mathematics Test Explanations

1. The correct answer is C. To find the distance

in miles that Shannon walked, add $1\frac{2}{3}$ and $2\frac{3}{5}$. To add mixed numbers, find the least common denominator. The least common denominator of 3 and 5 is 3×5 , or 15. To convert, multiply by $\frac{5}{5}$ (hint: $\frac{5}{5} = 1$, and multiplication by 1 does not change the value of a number). The result is $\frac{10}{15}$. To convert $2\frac{3}{5}$, multiply by $\frac{3}{3}$. The result is $2\frac{9}{15}$. Add $1\frac{10}{15}$ and $2\frac{9}{15}$, first add the whole numbers and then add the fractions. The result is $3\frac{19}{15}$, which reduces to $4\frac{4}{15}$.

Answer choice A is the most popular incorrect answer and comes from adding the whole numbers and then adding the numerators and the denominators separately.

2. The correct answer is J. To find an equivalent expression, multiply the constants ($4 \times 3 \times 2 = 24$), combine the terms ($x \times x \times x \times x \rightarrow x^{3+1+1} \rightarrow x^5$), and combine the terms ($y^2 \times y^2 \times y^2 \rightarrow y^6$). The result is $24x^5y^6$.

The most common incorrect answers are F and H, which come from multiplying the exponents of the x and y terms instead of adding them. If you chose G, you probably added the constants instead of multiplying them.

3. The correct answer is C. To find Mr. Wilk's pay per day, divide his annual salary, \$33,660, by the total number of days he works, 180. His pay per day is $\frac{33,660}{180} = \$187$. When Mr. Wilk takes a day off without pay and the school pays a substitute \$85, the school district saves the difference in these amounts, $187 - 85$, or \$102.

Answer choice E, the most common incorrect answer, is simply Mr. Wilk's pay per day and not the difference between his pay and a substitute's pay.

4. The correct answer is G. To find the score on the fifth 100-point test that will yield an average score of 80, first calculate the total of the four scores already obtained: $63 + 72 + 88 + 91 = 314$. To obtain an average of 80 on 5 tests, the total score on all 5 tests must be 80×5 , or 400. The score needed on the last test is equivalent to $400 - 314$, or 86.

Answer choice A is the average of the 4 scores, rounded to the nearest whole point.

The correct answer is B. To find the oxygen saturation level, divide the current number of milligrams per liter by the capacity in milligrams per liter: $\frac{64}{9.5} \approx 6.737$. Convert the result (0.6737) into a percent by multiplying by 100: 67.37% is approximately equal to 67%.

6. The correct answer is H. To find the length of fence needed to surround a rectangular lot 125 feet by 185 feet, calculate the perimeter. The formula for perimeter of a rectangle is 2 times the sum of the length and width, or $P = 2(l + w)$. Calculate the perimeter as follows: $2(125 + 185) = 2(310) = 620$.

7. The correct answer is G. To find an equivalent expression, simply distribute the a as follows: $ab - ac = a(b - c)$. Remember to keep track of the negative sign.

8. The correct answer is B. To solve for x in the equation $6x - 3 = -7$, add 3 to both sides of the equation, which results in the equation $6x = 10$. Divide both sides by 6, which results in $x = \frac{10}{6}$.

9. The correct answer is B. These four numbers will form an arithmetic sequence, a sequence in which each pair of successive terms differs by the same number. To find the difference, define d as that difference. If 13 is the first term, and 34 is the fourth term. By definition, the second term is $13 + d$. The fourth term, 34, can also be written as $(13 + d + d) + d$. Using that expression, obtain the equation $13 + d + d + d = 34$, or $13 + 3d = 34$. After subtracting 13 from both sides, divide by 3, which results in $3d = 21$, or $d = 7$. Thus the second term is $13 + 7$, or 20, and the third term is $20 + 7$, or 27.

10. The correct answer is J. To calculate the value of $x^2 + x^{\frac{1}{3}}$, first solve $x = 729$ for x . The solution is the cube root of 729, which is 9. Substitute 9 into the original expression, arriving at $9^2 + 9^{\frac{1}{3}}$. This expression simplifies to $81 + 3$, or 84.

The correct answer is C. To find the volume, substitute r in the equation $V = \left(\frac{4}{3}\right)\pi r^3$ as follows:

$$\left(0\left(\frac{4}{3}\right)\right)^3$$

$$= \left(\frac{4}{3}\right)\pi\left(\frac{64}{27}\right)$$

$$= \left(\frac{256}{81}\right)\pi$$

Recall that π is approx. 3.14, so $\left(\frac{256}{81}\right)(3.14)$

is about 9.92, or 10 when rounded to the nearest cubic inch.

12. The correct answer is F. The probability that the gumball chosen will NOT be green when there are 6 yellow gumballs, 5 green gumballs, and 4 red gumballs is the number of unfavorable outcomes (the number of times a yellow or red gumball can be chosen) divided by the number of total outcomes (the total number of gumballs). The number of favorable outcomes is 10 because there are 6 yellow gumballs and 4 red gumballs. The total number of outcomes is $6 + 5 + 4 = 15$. Thus, the probability of the gumball NOT being green is $\frac{10}{15}$, which can

be reduced to $\frac{2}{3}$.

Answer choice G is incorrect because it is the probability that a chosen gumball will be green.

13. The correct answer is D. To find the number of sports awards earned, multiply the number of participants in each sport by the ratio for that sport, and then add these 4 products. This is a matrix multiplication, as shown below:

$$\begin{bmatrix} 125 & 305 & 080 & 1 \\ 25 & 30 & 50 & 80 \end{bmatrix} \begin{bmatrix} 0.2 \\ 0.5 \\ 0.3 \\ 0.4 \end{bmatrix}$$

$$= 25(0.2) + 30(0.5) + 50(0.3) + 80(0.4)$$

$$= 15 + 15 + 32 + 32 = 67$$

14. The correct answer is G. To find the average number of students per section enrolled in US History, find the total number of students in all sections and divide by the number of sections. Add $25 + 29 + 24$ to get 78, then divide by 3. This results in an average of 26 students enrolled per section in US History.

If you selected answer choice F, you found the median, or middle number, which is not always the average. Of 24, 25, and 29.

15. The correct answer is B. The total number of books available is $(30) + (30 + 5) + 37 + 25$, which is 52. To find the class periods for which there are not enough books, find the total number

of books needed for each period, as given in the table below.

PERIOD	1	2	3	4	5
BOOKS NEEDED	23	49	59	27	27

The only entry in the table with more than 52 is 56 for period 3.

If you selected answer choice E, you probably used 60 as the number of available books and did not take into account the 8 missing books.

16. The correct answer is G. Because the sum of each row is equivalent, the sum of row 1 is the same as the sum of row 2.

$$\text{Row 1: } (-4x) + 9x + 2x = 7x$$

$$\text{Row 2: } 7x + (-3x) = 4x + ?$$

The question mark must represent $3x$, because $7x = 4x + 3x$. You could also perform these calculations using the sum values in column 1 and column 2.

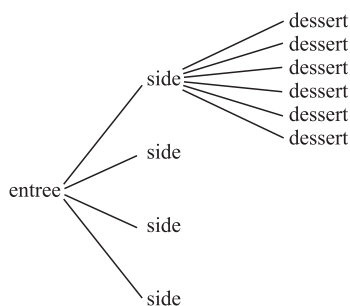
If you selected answer choice K, you may have thought that each sum must be 0 and found that would make the sums of row 2 and column 2 equal 0.

17. The correct answer is E. The x-coordinate is positive if A is to the right of the y-axis. The y-coordinate is positive if y is above the x-axis. The table shows the sign of x and the sign of y in the four quadrants.

QUADRANT	SIGN OF	SIGN OF	
		x	y
I		+	+
II		-	+
III		-	-
IV		+	-

Thus the signs are the same in Quadrants I and III (MI) only.

18. The correct answer is J. To find the number of distinct complete meals that Reggie can make from 5 different entrees, 4 different sides, and 6 different desserts, multiply the quantities in the 3 different groups together. Thus, there are $(5)(4)(6)$, or 120 distinct meals that Reggie can make. The figure below shows that for each meal, there are 4 sides, and for each side there are 6 desserts.



19. The correct answer is C. To find the number of liters of carbonated water needed to produce 750 bottles of soda, set up a proportion with ratios of liters of carbonated water to bottles of soda, as follows:

$$\frac{10,000}{3,000} = \frac{10(\text{liters carbonated water})}{750}$$

Cross-multiply and solve for x .

$$3,000x = 7,500,000$$

$$x = \frac{7,500,000}{3,000} = 2,500$$

20. The correct answer is F. To find the length of the diagonal, apply the Pythagorean theorem: the sides of the rectangle are the legs of a right triangle and the diagonal of the rectangle is the hypotenuse of the right triangle. Thus $c^2 = 20^2 + 48^2$, and $c = 52$.

21. The correct answer is A. To find an equivalent expression for $\frac{a}{c}$, either multiply or divide both the numerator and denominator by the same value. Because the question asks for all positive integers a , b , and c , and you are looking for an expression that is equivalent to $\frac{a}{c}$, multiply $\frac{a}{c}$ by $\frac{b}{b}$ to get $\frac{a \times b}{c \times b}$, answer choice A.

22. The correct answer is H. The slope-intercept form of the equation of a line states that $y = mx + b$. To find the slope-intercept form of the equation $6x - 2y - 4 = 0$, you must isolate y on the left side of the equation, as follows:

$$6x - 2y - 4 = 0$$

$$-2y - 4 = -6x$$

$$-2y = -6x + 4$$

$$y = 3x - 2$$

If you selected answer choice J, you probably forgot to switch the signs when dividing by -2 .

It is crucial to multiply all terms on both sides of the equation to arrive at a correct answer.

23. The correct answer is TO. To solve the quadratic equation $x^2 + 25x = 0$, factor out an x on the left side of the equation: $x(x + 25) = 0$. Now apply the product rule: $x = 0$ or $x + 25 = 0$. If $x = 0$, then $x = 0$, which is answer choice E.

24. The correct answer is J. To find $\tan B$ in $\triangle ABC$, take the ratio of the length of the opposite side to the length of the adjacent side: $\tan B = \frac{c}{a}$.

Answer choice F is $\cos B$; answer choice G is $\cot B$; answer choice H is $\sec B$; answer choice K is $\sin B$.

25. The correct answer is G. To find the radius, use the right triangle shown in the diagram. Half of the length of the chord is 4 inches, which is the length of one leg. The other leg is 3 inches long and the hypotenuse is 5 inches long. (Note: this is a right triangle because the distance between a point and a line is measured perpendicular to the line.) Use the Pythagorean Theorem, as follows: $r^2 = 3^2 + 4^2 \rightarrow r^2 = 9 + 16 \rightarrow r^2 = 25$. Since $r = 5$, the radius is 5 inches.

you selected answer choice F, you probably used 8 and 3 for the leg lengths and got $r^2 = 73$, which makes r equivalent to about 8.5 inches.

26. The correct answer is K. To find the force F (in newtons) corresponding to the spring length, L , of 0.23 meters when the relationship is given by the equation $L = \left(\frac{2}{3}\right)F$, first substitute 0.23 for L to get $0.23 = \left(\frac{2}{3}\right)F$. Next, subtract 0.05 from both sides to get $0.18 = \left(\frac{2}{3}\right)F$. Finally,

multiply both sides by $\frac{3}{2}$ since dividing by a fraction is equal to multiplying by its reciprocal, to arrive at $0.27 = F$.

27. The correct answer is C. To find the uniform circular speed, use the formula for volume: V of a rectangular prism with height h , length l , and width w , $V = lwh$. Substitute the given values for the variables and solve for h : $12,000 = (62)(85)(h)$, or $12,000 = 5,270h$. Thus $h = \frac{12,000}{5,270}$, or about 2.277, which is between 2 and 3.

28. The correct answer is G. To find the length of the segment LW in $\triangle LMV$, where the length of the hypotenuse is 22 and the cosine of angle L is

use the definition of cosine, which is the ratio of the length of the adjacent side to the length of the hypotenuse. In $\triangle LMN$, the cosine of angle L is the ratio of the length of segment LM to the length of the hypotenuse LN . Substitute the length of the hypotenuse and solve for LM , as follows:

$$\frac{3}{4} = \frac{LM}{22}$$

$$4 \times LM = 22 \times 3$$

$$LM = \frac{66}{4} = 16.5, \text{ answer choice G.}$$

29. The correct answer is A. To find the fraction of apples grown in Appleton, divide the number of apples grown in Appleton by the total number of apples grown. The table below shows the conversion of apple symbols to numbers for the 4 cities, as well as the total number of apples grown.

CITY	NUMBER OF APPLES GROWN
Golden Hills	4,500
Red Falls	3,000
Appleton	2,500
Shady Acres	2,000
All Cities	12,000

The fraction of apples grown in Appleton is $\frac{2,500}{12,000} = \frac{5}{24}$.

If you selected answer choice D, the most common incorrect answer you probably used the number grown in Appleton divided by the total number of apples from the other 3 towns only.

30. The correct answer is H. You are given that the length of AC is 19 units and the length of BD is 14 units. In addition, point C lies on segment AD as shown in the problem. Segment BC is the intersection of segment AC and segment BD . Therefore, the sum of the lengths AC and BD is the same as the sum of the lengths AD and BC . Substitute the actual lengths in $AC + BD = AD + BC$ as follows: $19 + 14 = 25 + BC \Rightarrow 25 = 25 + BC \Rightarrow 8 = BC$.
31. The correct answer is D. To find the x -coordinate where the lines with equations $y = -2x + 7$ and

$y = 3x - 3$ intersect, set $-2x + 7$ equal to $3x - 3$ and solve for x :

$$-2x + 7 = 3x - 3$$

$$-5x + 7 = -3$$

$$-5x = -10$$

$$x = 2$$

32. The correct answer is K. To solve the equation $4T - 7 = 7S + 4T$, add 7 to both sides to get $4T = 7S + 4T$, and divide by 4 on both sides to get $S = \frac{7S + 4T}{4}$.
33. The correct answer is D. The area of a parallelogram with base b and corresponding height h is (bh) . For parallelogram $ABCD$, segment AD is the base, with length 15, or 20 inches, and the corresponding height is 12 inches. Therefore, the area is $(20)(12) = 240$ square inches.
- The most common incorrect answer is E, which is the result of multiplying the two side lengths: $(5 + 15)(20) = 20(20) = 400$.
34. The correct answer is E. To find $(a - (a + 3))^4$, substitute $a = 3$ for a , as follows:

$$(a - (a + 3))^4$$

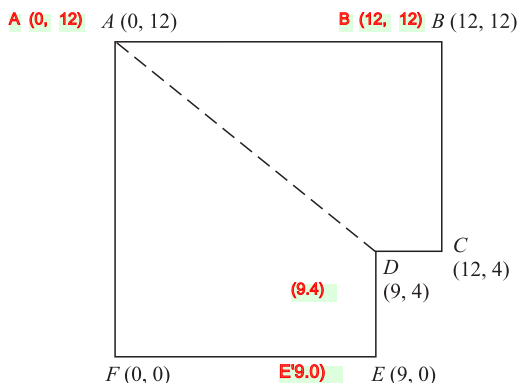
$$= (a - a - 3)^4$$

$$= (-3)^4, \text{ or } 81.$$

If you get stuck on this one, you can try choosing a specific value for a , such as 2. Then $b = 5$ and $(a - (a + 3))^4 = (2 - (2 + 3))^4 = (-3)^4 = 81$.

If you selected answer choice K, you might have gotten -3 for $(a - b)$, but solved $(-3)^4$ instead of $(-3)^4$, thus arriving at an answer of -81 . Remember that when you have an even numbered exponent, you can eliminate negative answer choices.

35. The correct answer is B. To find the location of the park office located halfway between points A and D, it makes sense to give coordinates to the points in relation to an origin (see diagram below). In this case it makes sense to choose point F as the origin because it is in the bottom-left of the figure. The first coordinate is the number of miles east of the origin, and the second coordinate is the number of miles north of the origin.



The park office is at the midpoint of the segment AD, and so the midpoint formula applies. For points with coordinates (x_1, y_1) and (x_2, y_2) , the midpoint has coordinates

midpoint has coordinates $\left[\frac{(x_1 + x_2)}{2}, \frac{(y_1 + y_2)}{2} \right]$. For A (0, 12) and D (9, 4), the midpoint is

$$\left(\frac{0+9}{2}, \frac{12+4}{2} \right) = \left(\frac{9}{2}, 8 \right) \text{ or } \left(4\frac{1}{2}, 8 \right).$$

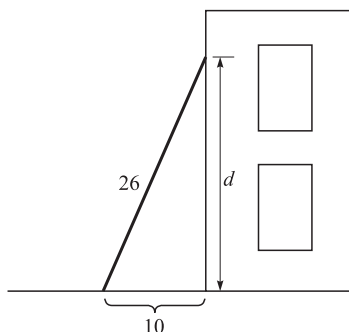
However, the problem asks you to relate the location of the office to its distance and direction from point A. To do so, subtract the coordinates of point A from the coordinates of the midpoint: $\left(\frac{9}{2} - 0, 8 - 12 \right)$, or

$$\left(\frac{9}{2}, -4 \right).$$

Thus, the location of the office relative to point A is $\frac{1}{2}$ miles east and 4 miles south.

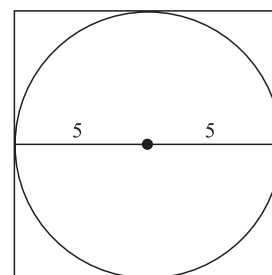
36. The correct answer is J. A simple way to solve this problem is to let x be the larger number. Therefore, you know that $y = 3x - 4$, and that $2y + 4x = 58$. Substitute $3x - 4$ for y in the last equation to arrive at $2(3x - 4) + 4x = 58$. This equation allows you to solve for x .

37. The correct answer is E. To find out how far a 26-foot ladder reaches up a building when the base of the ladder is 10 feet away from the building, it is useful to draw a picture, as shown below:



As you can see, the ladder forms the hypotenuse of a right triangle. With a length of 26, and the base of the ladder is 10 feet away from the building. Using the Pythagorean Theorem, $26^2 = 10^2 + d^2$, where d is the distance up the building. Simplifying, you get $676 = 100 + d^2$. $576 = d^2$. $d = 24$.

38. The correct answer is G. Recall that the area of a square with side s is s^2 . Finding the diameter of the circle, as shown above, it is clear that the side of the square is equal to the diameter of the circle, or $2(5) = 10$. The area of the square is 10^2 , or 100 square feet.



39. The correct answer is C. To find the length of the longest side of the second triangle, use ratios of corresponding sides of each triangle. For example, $\frac{9}{13} = \frac{x}{7}$, where x is the longest side of the second triangle. Cross-multiply to arrive at $117 = 7x$. Divide by 7 to get $x = \text{about } 16.7$.

If you selected answer choice B, the most common incorrect answer you might have noticed that the difference in lengths of the smallest sides was 2 and then simply added 2 to the longest side of the first triangle to get 15 for the longest side of the second triangle.

40. The correct answer is H. To find the measure of angle CDB in the figure, it is helpful to recognize that the sides BC and AD are parallel (definition of trapezoid) and are intersected by the transversal BD. Angles CBD and ADD are alternate interior angles, and thus are equal and both measure 250. Because A, D, and E all lie along the same line, angle ADE = 180. Because angle ADE is made up of angles CDB and CDE, the measure of these three angles add up to $180 + 250 + \text{angle CDB} = 1000$. Thus, the measure of angle CDB is 550.

41. The correct answer is D. This figure has 10 sides, but the lengths are given for only 7 sides. Those lengths add up to 36 inches. The perimeter is greater than this because of the missing 3 sides.

so you can eliminate answer choices A and B. To solve this problem, use the information given to find the missing sides; based on the figure, you can see that the sum of right-facing sides equals the sum of left-facing sides, and the sum of top-facing sides equals the sum of bottom-facing sides. It is easy to see that the bottom-facing sides will equal the top-facing side, which has a length of 14. Since we have the values for all of the left-facing sides ($5 + 4 + 5 + 12 = 36$), the right-facing sides also have the sum of 36. Thus, the perimeter is $14 + 14 + 36 + 36$, or 100.

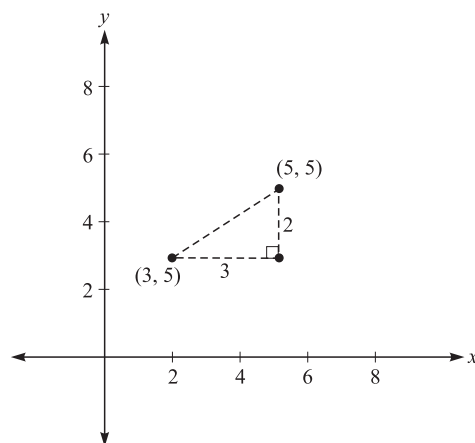
42. The correct answer is G. To find out how many of the 517 seniors in Brighton High School are going to a state college, first find how many are going to college. You are given that $\frac{4}{5}$ of the total number of graduating seniors (517) will be attending college: $\frac{4}{5} \times 517 = 413.6$, which can be rounded up to 414. Now, calculate the number of those 414 seniors who are going to a state college: $\frac{1}{2} \times 414$, or about 207 seniors are going to a state college. This is closest to answer choice G.

43. The correct answer is A. You are given that $x = y = (x - 2y)$ and are asked to solve $5x - 3y$. To do this, simply replace x with y and y with $-3y$, as follows:

$$\begin{aligned} 5x - 3y &= (x - 2y) - 2y \\ 5x - 3y &= (x - 4y) \\ 5(-3) - 3y &= (-3 - 4y) \\ 5(-3) - 3y &= (-3 - 4(-6)) \\ 5(-3) - 3y &= (-3 + 24) \\ 5(-3) - 3y &= 21 \\ 5(-3) - 3y &= 12 \end{aligned}$$

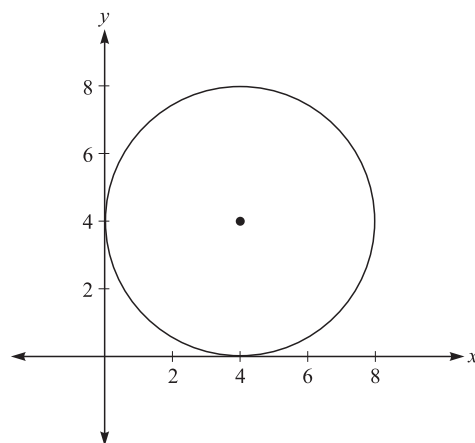
44. The correct answer is F. Because 125% of "the number" is 425, then "the number" is $425 \div 1.25$, which equals 340. Calculate 65% of 340: $340 \times 0.65 = 221$.

45. The correct answer is D. To find the distance between 2 points in the standard (x, y) coordinate plane, use the distance formula, which states that the distance is $\sqrt{(x_2 - x_1)^2 + (y_2 - y_1)^2}$. Therefore, the distance is $\sqrt{(5 - 2)^2 + (5 - 3)^2}$, or $\sqrt{3^2 + 2^2}$, which equals $\sqrt{13}$.



Another way to look at this problem would be to draw a picture as shown above. Then you can use the Pythagorean Theorem to find the hypotenuse of the triangle that is formed from the given points.

46. The correct answer is G. To find the ratio of the circumference of 2 circles for which the ratio of their radii is 9:16, recognize that both circumference and radius are 1-dimensional attributes of a circle. Because of that, the ratios should be the same. Another way is to use the ratio of the radii and let $9x$ and $16x$ be the radii of the two circles. Their circumferences would be $2\pi(9x)$ and $2\pi(16x)$, respectively. When you put them in a ratio you see that the ratio $2\pi(9x) : 2\pi(16x)$ simplifies to 9:16.
47. The correct answer is D. The best approach to this question is to draw a diagram as shown below:



equation of a circle is $(x - h)^2 + (y - k)^2 = r^2$. One way to find an equation for a circle is by using the coordinates of the center (h, k) and the radius, r . For this circle, the center is at $(4, 4)$ and the radius is 4. Given center $(4, 4)$ and radius 4, the circle has equation $(x - 4)^2 + (y - 4)^2 = 4^2$, or $(x - 4)^2 + (y - 4)^2 = 16$.

If you selected answer choice B, a common incorrect answer, you centered the circle at $(0, 0)$.

48. The correct answer is F. To find an equivalent expression for $\frac{2}{(1-i)} \times \frac{(1+i)}{(1+i)}$, simply perform the calculations, as follows:

$$\begin{aligned}\frac{2(1+i)}{(1-i)(1+i)} &= \frac{2(1+i)}{(1-i^2)} \\ \frac{2(1+i)}{(1-(-1))} &= \frac{2(1+i)}{2} \\ \frac{2(1+i)}{2} &= 1+i\end{aligned}$$

49. The correct answer is D. One approach to solving this problem is to make a table like the one below, showing the number of rows and the cumulative number of dots.

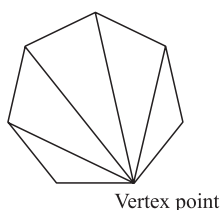
Row	1	2	3	4	5
Number of dots per row	2	4	6	8	10
Cumulative number of dots	2	6	12	20	30

The total number of dots in rows 1 and 2 is $2(2+1) = 6$; the total number of dots in row 3 is $3(3+1) = 12$, and so on. You should be able to see that for the n th row, the total is the product of n and $n+1$, or $n(n+1)$.

50. The correct answer is J. You are given that the total number of students is 24. If 21 students play basketball and 9 students play soccer, there must be some overlap between basketball players and soccer players. The total number of students who play basketball and/or soccer is $21+9=30$, or 30; therefore, $30-24=6$ students must play both sports.

51. The correct answer is E. To find the real numbers x such that $x+2 > x+5$, subtract x and 2 from both sides. The result is $0 > 3$, and because that inequality is never true, there is no solution for x . The solution set is the empty set.

52. The correct answer is H. As shown below, there are 4 diagonals coming from each vertex point.



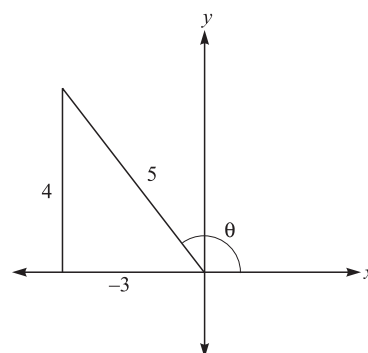
Because there are 7 vertex points, you might be tempted to conclude that there are 7×4 , or 28 diagonals. But this method counts each diagonal exactly twice. Therefore, there are $\frac{28}{2}$, or 14 diagonals.

53. The correct answer is D. You are given that 20% of John's friends selected vanilla ice cream as their favorite flavor. This means that 20% of the 3600 in the city will represent vanilla; 20% of 3600 is equivalent to $(0.20)(3600)$, or 720. If you choose one of the other answers, you may have found the degree measure of any of the other flavors.

54. The correct answer is G. One way to find $\tan \theta$ given that $\sin \theta = \frac{4}{5}$ and $\theta < \frac{\pi}{2}$, is to first find $\cos \theta$, then find $\frac{\sin \theta}{\cos \theta}$, which is equivalent to $\tan \theta$. To find $\cos \theta$, use the identity $\sin^2 \theta + \cos^2 \theta = 1$ and the fact that $\cos \theta > 0$ in Quadrant I. $\cos^2 \theta = 1 - \sin^2 \theta = 1 - \left(\frac{4}{5}\right)^2 = \frac{9}{25}$. $\cos \theta = \frac{3}{5}$.

Use substitution to get $\frac{\frac{4}{5}}{\frac{3}{5}} = \frac{4}{3}$. After subtracting $\frac{16}{25}$ from both sides, you get $\cos^2 \theta = \frac{9}{25}$. After taking the square root of both sides, you get $\cos \theta = \frac{3}{5}$. Because $\cos \theta < 1$ is in Quadrant II, $\cos \theta = -\frac{3}{5}$. Substitute this value into $\frac{\sin \theta}{\cos \theta}$ to get $\frac{(4/5)}{(-3/5)} = -\frac{4}{3}$.

Another way you could solve this problem would be to construct an angle in Quadrant II with $\sin \theta = \frac{4}{5}$ as shown below.



By virtue of the Pythagorean theorem, the missing side of the right triangle is 3 units long, and is negative because it is along the negative side of the x-axis. From this triangle, knowing that tangent is opposite over adjacent, you can get $\tan \theta = \frac{4}{-3} = -\frac{4}{3}$.

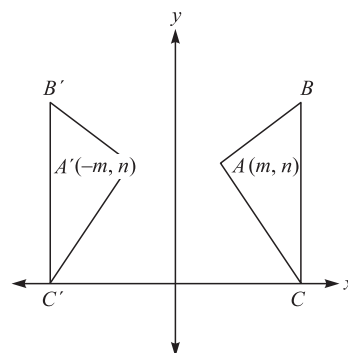
55. The correct answer is E. To find the system of inequalities represented by the shaded region of the graph, first, find the equations of the line through $(-1, 0)$ and $(0, 1)$ and the line through $(-2, 0)$ and $(0, 1)$. These lines are $y = x + 1$ (the y-intercept is 1) and $y = -\left(\frac{3}{2}\right)x + 1$ (the y-intercept is 1). Then, pay attention to the coordinating conjunctions and/or.

56. The correct answer is K. To find $f(x+h)$ when $f(x) = 2x^2 - 3$, substitute $(x+h)$ for x in $f(x) = 2x^2 - 3$, as follows:

$$\begin{aligned} f(x+h) &= 2(x+h)^2 - 3 \\ 2(x+h)^2 &= 2(x^2 + 2xh + h^2) + 3 \\ 2(x^2 + 2xh + h^2) &= 2x^2 + 4xh + 2h^2 + 3 \end{aligned}$$

57. The correct answer is D. The equation $y = \frac{x^2 + 3x}{x}$ can be simplified to $y = \frac{x(x+3)}{x}$. Therefore, the graph of this seemingly complicated equation actually looks like a line, not a parabola, so eliminate answer choices A and B. This is equivalent to $y = x + 3$ except when $x = 0$. When $x = 0$, the original equation is undefined. So the correct graph is $y = x + 3$, with a point removed where $x = 0$.

58. The correct answer is F. To find the coordinates of vertex A after it is reflected across the y-axis, remember that a reflection across the y-axis does not change the sign of the y-coordinate but does change the sign of the x-coordinate. Therefore, you can eliminate answer choices G, H, and J. You might sketch a figure like the one below.



The reflection of $A(m, n)$ across the y-axis is $A'(-m, n)$. The most popular incorrect answer is J, which gives the reflection of A over the line $y = x$.

59. The correct answer is B. To obtain an expression for y in terms of x when $x = 3r - 4$ and $y = 3r + 2$, first solve $x = 3r - 4$ for r , as follows:

$$\begin{aligned} x = 3r - 4 &\quad x = 3r - 4 \\ x + 4 &= 3r \\ \frac{x + 4}{3} &= r \end{aligned}$$

Substitute that expression for r into $y = 3r + 2$, and solve for y :

$$\begin{aligned} y &= 3\left[\frac{x + 4}{3}\right] + 2, \text{ which simplifies to } y = \\ &= (x + 4) + 2, \text{ or } y = x + 6. \end{aligned}$$

60. The correct answer is H. To find $\cos\left(\frac{\pi}{12}\right)$ using $\cos(\alpha - \beta) = (\cos \alpha)(\cos \beta) + (\sin \alpha)(\sin \beta)$ given that $\frac{\pi}{12} = \frac{\pi}{3} - \frac{\pi}{4}$, you can first substitute $\frac{\pi}{3}$ for α and $\frac{\pi}{4}$ for β and get $\cos\left(\frac{\pi}{3} - \frac{\pi}{4}\right) = \left(\cos \frac{\pi}{3}\right)\left(\cos \frac{\pi}{4}\right) + \left(\sin \frac{\pi}{3}\right)\left(\sin \frac{\pi}{4}\right)$. Using the table or values to substitute into that equation, you get $\cos \frac{\pi}{12} = \left(\frac{1}{2}\right)\left(\frac{\sqrt{2}}{2}\right) + \left(\frac{\sqrt{3}}{2}\right)\left(\frac{\sqrt{2}}{2}\right)$, or $\frac{(\sqrt{6} + \sqrt{2})}{4}$.

Reading Test Explanations

PASSAGE PASSAGE I

- The best answer is B. The passage takes place on a ship, the *Nellie*, and the narrator is one of the crew members. He uses words like "we" and "us" and "us" when referring to the crew, implying his membership to this group. The other answer choices are not supported by the passage.
- The best answer is F. Although the passage states, "for some reason or another we did not begin that game or dominoes," it is reasonable to assume that it was because they were too tired from the use of the words "lazily" and "meditative." The other answer choices are not supported by the passage.
- The best answer is C. The passage states that "the Lawyer had, because of his many years and many virtues, the only cushion on deck," indicating that since he was the eldest crew member and had the other crew members' respect, he was afforded the comfort of the cushion. The other answer choices are not supported by the passage.
- The best answer is F. The definition of "placid" is "not easily excited or upset; calm." Since the men on the ship were rowing "meditative" and seemed not to have an abundance of energy, it makes sense that they simply wanted to sit calmly. The other answer choices are not supported by the context of the passage.
- The best answer is D. In the fifth paragraph the narrator is describing how Marlow is unlike most sailors: "The yams of seamen have a direct simplicity, the whole meaning of which lies within the shell of a cracked nut. But Marlow was not typical and to him the meaning of an episode was not inside like a kernel but outside. This is to say that typical sailors tell simple, uncomplicated tales, while Marlow tends to tell stories that are layered and complex. This best supports answer choice D.
- The best answer is H. Since Marlow states that the episode which he is about to recount "seemed to somehow throw a light on everything about (him)," we can assume that this episode had a profound effect on him. The other answer choices are either not supported by the passage or are beyond the scope of the passage.
- The best answer is A. The passage states that, "The Director of Companies was our captain and our host. We four affectionately watched his back as he stood in the bow, looking toward the sea. On the

whole river there was nothing that looked half so nautical. He resembled a pilot, which to a seaman is trustworthiness personified." This best supports answer choice A.

- The best answer is G. There are clues in the passage to indicate that the narrator, as well as the other crew members, were not thrilled when Marlow began to speak. Marlow's very first comment was "accepted in silence" and "no one took the trouble to grunt even." In the next paragraph the narrator begins to realize that the crew was "rated, before the ebb began to run to hear about one of Marlow's inconclusive experiences." Since "resigned means 'accepting that something can not be avoided'" and "tolerance means 'patience,'" making G the best answer.
- The best answer is A. In the third paragraph the passage states that the men's mutual interest in the sea created a bond between them capable of "holding '(their) hearts together through long periods or separation,'" "making '(them) tolerant of each other's yams," and making them accepting of each other's "convictions." Answer choice A is not mentioned in the passage.
- The best answer is J. The passage states that the crewmen watched him "affectionately," meaning "showing fondness or liking." The captain is also described as "trustworthiness personified," indicating that the other crew members have the utmost faith and trust in him. This best supports answer choice J.

PASSAGE PASSAGE II

- The best answer is B. As stated in the passage, "in the past 30 years known supplies have dwindled from 300 TCF (to around 150 TCF," or known supplies have decreased by about 50 percent. Answer choice A is incorrect because the passage states that at predicted rates of consumption, the United States' natural gas supply would be exhausted in approximately five years. Answer choice C is incorrect because natural gas provides roughly 25 percent of America's energy needs, which has nothing to do with the decrease in supply. Answer choice D is incorrect because the passage states that it is extremely difficult to obtain natural gas from other countries, not from within the US.

12. The best answer is G. At the end of the passage, the author states that "consumers and business leaders should not rely on liquid natural gas to solve America's energy needs." This can also be inferred from the point that natural gas is currently only supplying approximately 25 percent of the nation's energy needs, and even at this level there is much concern over whether supplies will run out. Answer choice H may appear to be correct, but the passage merely states that countries such as Japan and China will also be searching for fuel sources, including liquid natural gas, outside of their own countries in the future.
13. The best answer is D. This question can be difficult if you do not read the answer choices carefully. The third paragraph is devoted to a discussion on the limited availability of liquid natural gas, and the expense of processing the gas, which makes answer choice D the best selection. Answer choice A may appear correct; however, the passage focuses on the supply and use of liquid natural gas around the world. The passage does not discuss the supply and use of any other energy sources. Answer choice B was mentioned briefly in the passage but is not a main idea. Answer choice C is beyond the scope of the passage.
14. The best answer is F. As stated in the second paragraph, it is predicted that "liquid natural gas imports will increase by almost 50 percent in a few short years." Although America may be reluctant to import liquid natural gas, it is necessary for the nation to do so in order to relieve and/or avoid shortages. Answer choice H may appear to be correct; however, the author states that even though transportation costs have been substantially decreased due to new technology, importing liquid natural gas "is still often uneconomical." Answer choices G and J are beyond the scope of the passage.
15. The best answer is C. According to the passage, "Currently, Canada is the largest liquid natural gas supplier for the United States." Japan and China, two countries in Asia, are providing competition in attaining liquid natural gas.
16. The best answer is F. The first sentence of the third passage states "One of the largest misconceptions about liquid natural gas is that it is an abundant source of natural gas." While the passage goes on to discuss the expense of creating new processing facilities and prices making liquid natural gas uneconomical, the only misconception mentioned is the fact that liquid natural gas is an abundant source of natural gas. Other answer choices are not supported by the passage.
17. The best answer is C. The context surrounding the word *phenomenal* discusses the surprisingly large growth experienced in natural gas demand and the huge impact that such growth will have on depletion of the resource. This context clearly indicates that the demand is increasing at "phenomenal," or extraordinary, rates; other answer choices are not supported by the context of the passage.
18. The best answer is G. Answer choice G is the only reason that America is choosing liquid natural gas: consumers are demanding it. So America must provide it. Answer choices F and H express current problems with choosing liquid natural gas; transportation and processing are both very costly relative to other fuel sources. Answer choice J is a potential problem. Liquid natural gas is inherently expensive due to its transportation and processing costs. Natural gas prices are the market for liquid natural gas. Will plummet, making liquid natural gas an uneconomical choice for consumers.
19. The best answer is D. As stated in the paragraph, "natural gas demand is increasing at phenomenal rates" and its consumption is expected to grow from 22 trillion cubic feet per year to 32 trillion cubic feet per year in less than a decade. Answer choice C may appear to be correct; however, the passage simply states that Canada is the largest liquid natural gas supplier for the United States alone. The passage does not compare Canadian liquid natural gas exports to those of any other country; therefore, we do not know whether or not Canada is the world's largest exporter. Likewise, the other answer choices are not supported by the passage.
20. The best answer is J. In the paragraph, the vessel in question is described as something that the liquid natural gas is injected into for transportation. It does not make sense that a liquid would be injected into a "process," "source," or "facility" for transportation. Answer choice J, "container," is the most logical choice.
- PASSAGE III
21. The best answer is B. Throughout the passage, the author talks about the prevalence of the word "good," further discusses several different meanings and methods for interpreting the word, and suggests that there is no one specific denotation for the word "good." The other answer choices are not supported by the context of the passage.

22. The best answer is H. As stated by the author, babies are so young and powerless ("this elementary life has not yet acquired positive standards or measurement") that they can only be judged in negative terms, "a failure to disturb." Answer choice G may appear to be correct; however, the "anxious" mother is still able to judge whether her baby has been good by what the baby did or did not do—in this case, cry.

23. The best answer is A. The author states that "we employ the word or some synonym or it during pretty much every waking hour of our lives. Wishing some test of this frequency, I turned to Shakespeare." In simpler terms, the author is asserting that we use the word "good" or some form or it constantly and he believed that the works of Shakespeare would provide a good test of this notion. In other words, if Shakespeare used forms of the word "good" as often as the author predicted, the author's theory on use of the word would be proven true. This best supports answer choice A.

24. The best answer is H. The author writes "goodness always has reference to something outside itself, and is measured by its performance of an external task." The author goes on to write, "The knife is good for cutting and the day for business. To be bad or good implies external reference." This best supports answer choice H.

25. The best answer is D. The author describes a quote by Shakespeare's Portia as being spoken "lucidly," "lucidly," and goes on to analyze and apply Portia's quotation. The author does so in a positive light, thus eliminating answer choices A and B. It does not make sense that Portia's quote was "enthusiastic," or excited. Answer choice D makes the most sense within the context of the passage; "coherently" means "logically" and "meaningfully."

26. The best answer is H. When discussing the knife, the author states, "Its goodness always has reference to something outside itself." Although the passage mentions cutting wood, the author never says that a knife is good only if it cuts wood. Answer choices G and J are not supported by the context of the passage.

27. The best answer is A. The author begins by discussing goodness on a clear, tangible object—a knife. The author then moves on to discussing the goodness of the weather—something "not so palpable." Answer choice A, "apparent," makes the most sense. The goodness of an intangible thing, such as the weather, was not nearly as "evident" or "clear" as that of a tangible object.

goodness of the weather is not less "complicated" than that of the knife; likewise, it does not make sense that the goodness of the weather would be less "mijwerful" or "drab" than that of the knife.

28. The best answer is J. The author states, "We must have some respect for order in mind in reference to which the goodness is compared." In other words, in order to understand what "good" means, you must know specifically what is being referred to as "good" before interpreting the definition of "good." Answer choice G may appear to be correct, but the passage states that "good" always means good "for," thereby asserting that the two are actually identical concepts.

29. The best answer is D. Throughout the passage the author refers to the actual application of the word "good," and that the word "must" be useful for something. This best supports answer choice D.

30. The best answer is G. According to the author, goodness in life "attends all our wishes, acts, and projects as nothing else does, so that no estimate of its influence can be excessive." The author furthers this point by adding that every action we take is in hopes of achieving something good. In simpler terms, the author is saying that because our pursuit of goodness has such a huge impact on our lives, there is no way we could overestimate or over-emphasize the influence this has on us. Answer choice F is incorrect because it is the opposite of what the author is trying to say. Answer choices H and J are beyond the scope of the passage.

PASSAGE PASSAGE IV

31. The best answer is A. At this point in the passage, the defense mechanisms of armadillos are being discussed; tanks were strengthening their positions, they would be improving their safety and increasing their level of protection from enemies. Therefore, if armadillos "often scurry under thorn bushes, rather like tanks strengthening their positions," they are giving themselves better protection against their predators. This best supports answer choice A.

32. The best answer is J. The first paragraph states that armadillos "look far more awkward than most animals." The passage then goes on to describe the armadillo as an "alien creature," which suggests that an armadillo's awkward appearance is what

- makes it an alien creature. The other answer choices are not supported by the passage.
33. The best answer is D. According to the passage, the armadillo is "safer than most animals who want the Texas roads" because its shell protects it from predators. Answer choices A through C are beyond the scope of the passage and, therefore, are incorrect.
34. The best answer is G. The author's statement that "if chased into their burrows, they are able to arch their armor against the burrow walls making them nearly impossible to dislodge" suggests that the armadillo curves its back against the burrow walls, wedging itself into the burrow. The other answer choices are not supported by the passage.
35. The best answer is C. Information in the passage indicates that the nine-banded armadillo is the only species of animal in which this remarkable trait occurs, which is speaking in reference to their ability to have four identical offspring emerging from the same egg. This best supports answer choice C.
36. The best answer is H. According to the passage, most Texans feel the armadillo is a "pest." When it destroys crops and other plants that are low to the ground, however, most Texans also see that armadillos provide "benefits" as well, such as its eating harmful insects and aiding in medical research. This best supports answer choice H.
37. The best answer is B. Although the passage mentions both opossums and farmers, neither are identified as predators or the armadillo. Both dogs and cars are acknowledged as predators of the armadillo, however, the passage explicitly states that "In addition to threats of being eaten by an opportunistic predator, the armadillo must also endure a more severe danger, automobiles." Therefore, automobiles are more dangerous to armadillos than are any other predator. This best supports answer choice B.
38. The best answer is F. The passage states that, "Texans see the armadillo as a pest, since they have a tendency to ruin corn by eating the parts of the plants which are low to the ground." This suggests that armadillos are damaging crops. The other answer choices are not supported by the passage.
39. The best answer is C. According to the passage, armadillos "are born fully formed with their eyes open" so it makes sense that they would be able to see. The other answer choices contradict statements made elsewhere in the passage or are unsupported by the passage.
40. The best answer is J. The only scientific name mentioned, *Dasypus novemcinctus*, is directly defined as being the name for the nine-banded armadillo. The other choices are similar species of armadillo, but not mentioned in reference to that specific scientific name.

Science Reasoning Test Explanations

PASSAGE PASSAGE I

- The best answer is B. Based on the data in all three tables, the highest average speed was recorded in Table 3, which shows the results of Study 3. Therefore, the highest average speeds resulted from using studded, hard rubber wheels, answer choice B.
- The best answer is H. The average speed recorded in Table 1 is 3.28 feet per second. This speed is not greater than the speed recorded in Trial 2 (3.33 ft/s); likewise, it is not less than the average speed recorded in Trial 1 (3.21 ft/s), eliminate answer choices F and G. The speed recorded in Trial 2 (3.23 ft/s) is less than the average speed recorded in Table 1 (3.28 ft/s), so answer choice H must be correct.
- The best answer is D. To answer this question, you must remember that Table 1 is associated with deeply treaded hard rubber wheels, Table 2 is associated with smooth rubber wheels lacking treads, and Table 3 is associated with studded, hard rubber wheels. When you compare the average recorded speed, you will see that the average speed of a car with studded, hard rubber wheels (6.44 ft/s) is approximately twice the average speed of a car with deeply treaded hard rubber wheels (3.28 ft/s) answer choice D.
- The best answer is F. Since the passage indicates that all three of the studies were "conducted indoors in a temperature-controlled room," you can eliminate answer choices G and H. The studies also dealt with different types of wheels and the traction they would provide, so the likely reason for the highest average speeds is greater friction, answer choice F.
- The best answer is A. During which of the following trials did the car travel most slowly?
 - Study 2, Trial 1 = 57 seconds
 - Study 2, Trial 2 = 56 seconds
 - Study 3, Trial 1 = 11.3 seconds
 - Study 1, Trial 2 = 232 seconds

Because it took the car in Study 2, Trial 1 longer to travel the constant distance of 75 feet, that car must have been traveling more slowly than the cars in each of the other answer choices.

PASSAGE PASSAGE II

- The best answer is J. The two scientists are discussing how the planet Pluto should be classified: as a planet, or as some other celestial object. Scientist 1 believes Pluto should retain its status

as a planet, while Scientist 2 believes Pluto would be more accurately categorized as a Kuiper Belt comet. This best supports answer choice J.

- The best answer is B. Scientist 2 explains that currently two categories of planets exist: rocky and gaseous. The scientist then goes on to say that Pluto does not fit into either of these categories because it is composed of an icy material. This best supports answer choice B.
- The best answer is E. The question asks for the identification of a characteristic that does not differentiate Pluto from asteroids and comets. Neither Pluto nor asteroids and comets can generate heat through nuclear fission, so this is not a differentiating characteristic, making this answer choice the best.
- The best answer is B. Scientist 2 maintains that Pluto is not like the other planets due to its icy surface. If the ice melted and revealed that Pluto's surface was similar to Mars, Scientist 2's argument would be significantly weakened.
- The best answer is J. Both scientists mention the irregularity of Pluto's orbit in their respective arguments. Scientist 1 states, "Pluto's orbital path is irregular as compared with the other planets of the solar system," and Scientist 2 also makes note of the "eccentricity of Pluto's orbit."
- The best answer is A. One of the arguments that Scientist 1 makes for Pluto not being a comet is that Pluto is far too massive. If a comet were discovered with a diameter of 1,500 miles, it would be even larger than Pluto, which has a diameter of 1,413 miles. This would nullify the scientist's argument that Pluto cannot be a comet because comets are much smaller than Pluto.
- The best answer is II. One reason that Scientist 2 offers to support the argument for Pluto to be a Kuiper Belt object is that both have strange, atypical orbital patterns.

PASSAGE PASSAGE III

- The best answer is G. The question asks you to look at the overall trends of the data sets for each substance. A good way to measure the degree to which data varies would be to find the range, meaning subtract the lowest value from the highest value for each individual substance. In this problem, it is clear that NaCl varies the least with temperature.

14. The best answer is F. In this question you are asked to look at the trends of the substances, especially at their concentrations as they change with increasing temperature. In the data set, some substances become more soluble with increasing temperature, while some become less soluble. The graph represents the solubility curve for a substance that gets less soluble with increasing temperature. Looking at the possible answer choices, HCl is the only logical choice.

15. The best answer is C. It is clear from the table that each substance reacts differently in its solubility depending on the temperature. However, each substance shows a clear trend in whether it gets more or less soluble with increasing temperature.

16. The best answer is J. According to Table 1, HCl has a concentration of 55 g/100 g H₂O at 40°C, and a concentration of 48 g/100 g H₂O at 60°C. Therefore, at 50°C it would likely have a concentration of 55 + 48 = 51.5 g/100 g H₂O.

17. The best answer is D. By looking at the trend in concentration for NH₄Cl, 50 g are dissolved between the 40°C and 60°C measurements. The logical answer choice would then be 50°C.

PASSAGE IV

18. The best answer is H. As shown in Table 1, the estimated mineral volume of the oldest salt pan (21 million years old) is 12,150,000 cubic kilometers; the estimated mineral volume of the youngest salt pan (4.5 million years old) is only 2,000,000 cubic kilometers. The deposits were formed as collected water evaporated, so the much larger volume of minerals in the oldest basin suggests that more water has collected and evaporated there.

19. The best answer is B. As Table 1 shows for Study 1, there is a direct, positive relationship between mineral volume and age of the salt pans. As the age increased, the mineral volume is also shown to increase in each of the four cases. This direct relationship is shown in the graph in answer choice B.

20. The best answer is J. There is no information contained within either Study 1 or Study 2, or in either of the tables that makes reference to the quantity of plant fossils. The only references to plant fossils are that they were found in each salt pan, that the ages were similar, and that the flooding was thought to cause plant extinction. Plant species is not shown by the data to influence quantity of fossils.

21. The best answer is C. Since there is a direct, positive relationship between salt pan age and mineral volume, if a salt pan were to have formed before the oldest salt pan in the study, then it would likely contain a greater volume of minerals than that pan is shown to contain. Since the oldest pan in the study contained 12,150,000 cubic kilometers of minerals, a pan older than that would have a higher mineral value.

22. The best answer is H. Since the ages of the fossils are stated in Study 2 to be similar to the ages of the salt pans, a fossil that is 9.7 million years old would be closest in age to Salt pan C (10.8 million years old) and therefore would most likely be found in a similar salt pan.

PASSAGE V

23. The best answer is C. As shown in Table 1, the temperature of gasoline is between 40 and 70°C, which makes it greater than 200°C. Despite this being the lowest temperature for petroleum gas, it is still correct as the choices of less than 40 and greater than 70°C exclude gasoline completely.

24. The best answer is J. Figure F1 shows a diagram of the fractionating tower, which places residue as the first substance to be condensed and drawn off. Additionally, the passage states that the vapor rises through the tower and cools, condensing at the appropriate points—this means that the substance with the hottest condensation temperature would be first.

25. The best answer is C. Within the passage, it says that, "this process is called fractional distillation, whereby the crude oil is heated. Gasoline, residue, and gas oil are all products that result from the process of fractional distillation." The passage clearly discusses crude oil in the context of a raw material.

26. The best answer is F. A condensation point of 900°C would place naphtha in Table 1 between gasoline (40–70°C) and kerosene (100–1200°C), as it is above the upper end of gasoline and below the lower end of kerosene.

27. The best answer is A. Within the passage, it is discussed that "the crude oil is super-heated in the boiler to about 600°C (which vaporizes the crude oil)." Since this is the temperature at which crude oil vaporizes, answer choice A is correct.

28. The best answer is G. As the passage states, "the vapors rise in the tower to certain levels where