

# avyan mahajan

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College Board - SAT Practice Test 7

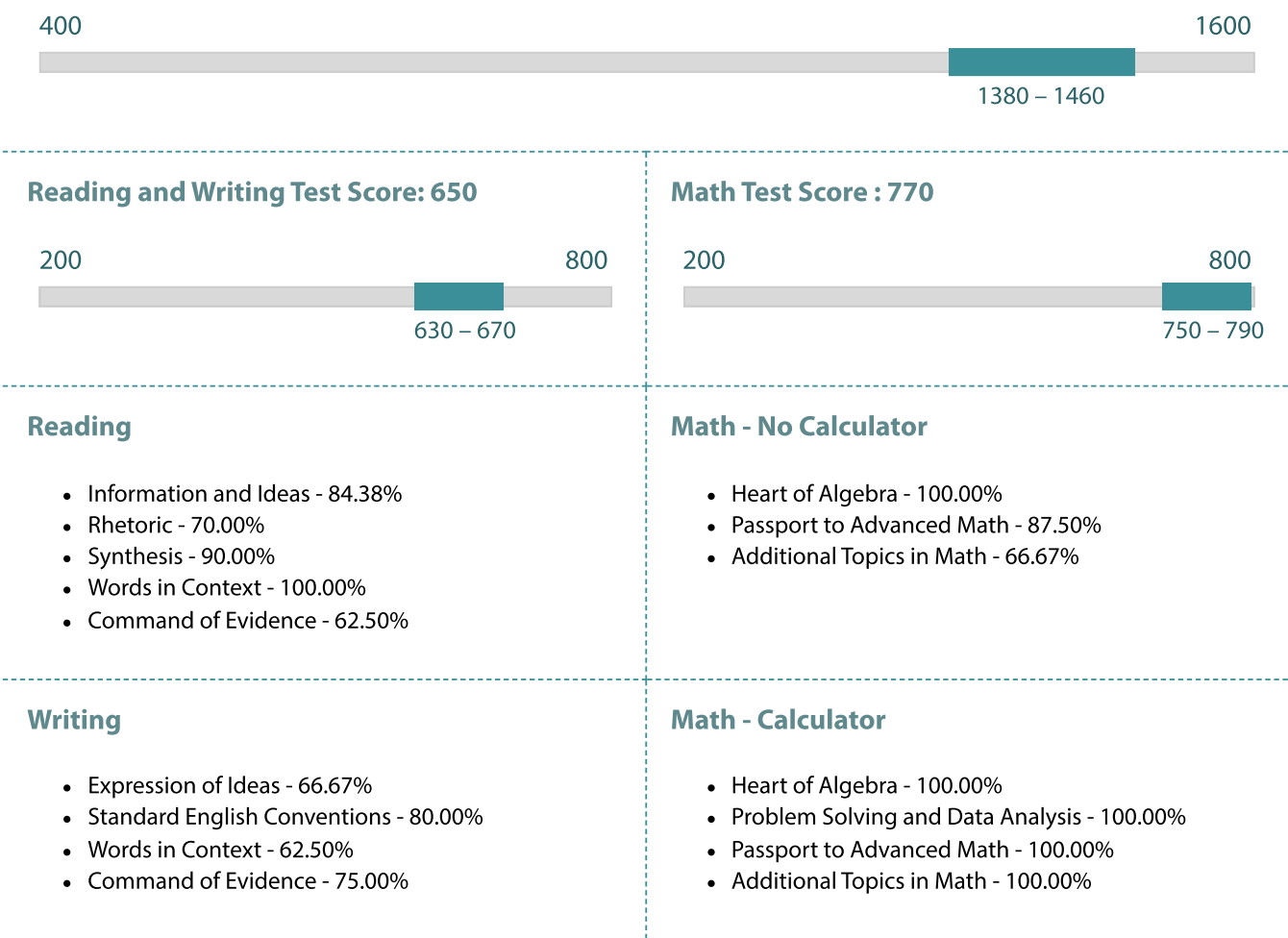
Date: August 5, 2023



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# Overview

Composite Score: 1420



## Understanding Your Scores

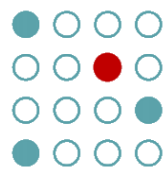
Your composite score combines section scores in Math and Evidence-Based Reading and Writing. It does not include your essay score. Your subscores are based on particular question types within each test section. These scores assess skills specific to the Reading test + Writing and Language test, Writing and Language test alone, and Math test alone. There are seven subscores in total. Four will be related to particular questions in the Reading and Writing Test: Words in Context, Command of Evidence, Expression of Ideas, and Standard English Conventions. The other three relate to specific types of questions on the Math Test: Heart of Algebra, Problem Solving and Data Analysis, and Passport to Advanced Math. These scores are on a scale from 1 to 15.

Subscores Breakdown					
Subscore Area	Correct	Incorrect	Omitted	Total	Score (1-15)
Information and Ideas	27	5	0	32	13
Expression of Ideas	16	8	0	24	10
Standard English Conventions	16	4	0	20	12
Heart of Algebra	19	0	0	19	15
Problem Solving and Data Analysis	16	0	0	16	15
Passport to Advanced Math	14	1	0	15	14
Words in Context	15	3	0	18	13
Command of Evidence	11	5	0	16	11

Your cross-test score for the sections below are based on your performance on specific questions across the different tests relating to specific types of content. These scores assess skills shared across the Reading and Writing and Math sections. There are two cross-test scores: Analysis in Science and Analysis in History/Social Studies. For example, your cross-test score in Analysis in Science will be based on your performance on questions relating to science passages on the Reading Test as well as questions using scientific data on the Math Test. These scores are on a scale from 10 to 40.

Cross-Test Scores Breakdown					
Cross-Test Scores	Correct	Incorrect	Omitted	Total	Score (10-40)
Analysis in History/Social Studies	22	5	0	27	34
Analysis in Science	23	4	0	27	36

## Suggested Review



Look over any questions you answered incorrectly and try to solve them again. Did you just make some avoidable errors, or did you get questions wrong because you did not know how to solve them? You can find detailed answer explanations for these problems online.



Create a study plan and schedule for your SAT preparation. Make sure you leave enough time to review and practice each concept you'd like to improve as well as some time to refresh your memory on concepts you're already familiar with.

Reading & Writing: 650























Section	Correct	Incorrect	Omitted	Total	Scaled Score
Reading	43	9	0	52	34
Writing	32	12	0	44	31

Reading Section Breakdown

	Subject Area	Correct	Incorrect	Omitted	Total
Information and Ideas	<div></div>	27	5	0	32
Rhetoric	<div></div>	7	3	0	10
Synthesis	<div></div>	9	1	0	10
Words in Context	<div></div>	10	0	0	10
Command of Evidence	<div></div>	5	3	0	8
Analysis in History/Social Studies	<div></div>	20	1	0	21
Analysis in Science	<div></div>	17	4	0	21

Answers														
Question:	1	2	3	4	5	6	7	8	9	10	11	12	13	14
Your Answer:	D	A	B	B	B	C	C	B	B	D	D	A	A	D
Correct Answer:	D	A	A	B	D	B	C	B	D	D	D	A	A	D
Topic:	IT	IR	RC	IW, W	IE	IC, E	RO	IR	IC, E	IW, W	RP	IE	IC, E	RP
Difficulty:	4	2	4	3	3	2	5	3	2	3	3	2	2	2
Question:	15	16	17	18	19	20	21	22	23	24	25	26	27	28
Your Answer:	D	C	D	B	D	C	B	C	C	D	C	A	C	A
Correct Answer:	D	C	D	B	D	C	B	C	A	D	C	A	C	B
Topic:	IW, W	RV	IC, E	IW, W	Q	Q	Q	RP	RP	II	IC, E	RP	II	IC, E
Difficulty:	1	3	2	3	3	4	5	3	4	4	3	3	3	2
Question:	29	30	31	32	33	34	35	36	37	38	39	40	41	42
Your Answer:	C	D	B	D	B	C	B	B	C	A	D	A	A	B
Correct Answer:	C	D	B	D	B	C	B	B	C	A	C	A	A	C
Topic:	IT	IW, W	IW, W	IW, W	II	IC	IW, W	II	IC	M	M	M	M	RO
Difficulty:	1	3	2	2	3	2	3	4	3	4	3	4	4	3
Question:	43	44	45	46	47	48	49	50	51	52				
Your Answer:	D	C	C	A	C	A	A	B	A	D				
Correct Answer:	D	D	C	A	C	A	A	B	A	D				
Topic:	IW, W	II	IC, E	IE	IC, E	RR	IW, W	Q	Q	Q				





























Difficulty:	3	3	2	3	3	4	3	4	2	5				
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Reading Questions Breakdown					
	Category/Topic	Correct	Incorrect	Omitted	Total
<b>Information and Ideas</b>		27	5	0	32
Direct Information (IE)		2	1	0	3
Vocabulary in Context (IW)		10	0	0	10
Describing Relationships (IR)		2	0	0	2
Implied Information (II)		4	1	0	5
Main Ideas (IT)		2	0	0	2
Finding Evidence (IC)		7	3	0	10
<b>Rhetoric</b>		7	3	0	10
Author's Reasoning (RR)		1	0	0	1
Finding Arguments (RC)		0	1	0	1
Purpose (RP)		4	1	0	5
Point of View (RV)		1	0	0	1
Overall Structure (RO)		1	1	0	2
<b>Synthesis</b>		9	1	0	10
Comparing Passages (M)		3	1	0	4
Graphics (Q)		6	0	0	6
<b>Words in Context</b>					
Words in Context (W)		10	0	0	10
<b>Command of Evidence</b>					
Command of Evidence (E)		5	3	0	8
<b>Analysis in History/Social Studies</b>					
History and Social Studies (AH)		20	1	0	21
<b>Analysis in Science</b>					
Science (AS)		17	4	0	21

## Writing Section Breakdown

	Subject Area	Correct	Incorrect	Omitted	Total
Expression of Ideas	<div><div></div></div>	16	8	0	24
Standard English Conventions	<div><div></div></div>	16	4	0	20
Words in Context	<div><div></div></div>	5	3	0	8
Command of Evidence	<div><div></div></div>	6	2	0	8
Analysis in History/Social Studies	<div><div></div></div>	2	4	0	6
Analysis in Science	<div><div></div></div>	6	0	0	6

[illegible]

Writing Questions Breakdown					
Category/Topic		Correct	Incorrect	Omitted	Total
<b>Expression of Ideas</b>		16	8	0	24
Transitional Words and Sentences (OT)		4	2	0	6
Precise Word Choices (EP)		1	1	0	2
Concise Sentences (EC)		2	1	0	3
Style and Tone (ET)		1	0	0	1
Logical Sentence Order (OL)		1	1	0	2
Clear Sentences (ES)		1	1	0	2
Main Idea (DP)		1	1	0	2
Relevant Information (DF)		1	1	0	2
Graphic Analysis (DQ)		1	0	0	1
Supporting Evidence (DS)		3	0	0	3
<b>Standard English Conventions</b>		16	4	0	20
Joining Sentences with Conjunctions (SS)		0	1	0	1
Punctuating a Sentence (PW)		1	0	0	1
Pronoun Agreement (UPA)		1	0	0	1
Matching Sentence Structures (SP)		2	0	0	2
Appropriate Prepositions (UC)		1	0	0	1
Punctuating a List (PL)		1	0	0	1
Ending a Sentence (PE)		1	0	0	1
Verb Agreement (USV)		1	1	0	2
Confusing Words (UF)		2	0	0	2
Extra Clauses (PC)		2	0	0	2
Unnecessary Punctuation (PU)		2	0	0	2
Making Whole Sentences and Avoiding Run-ons (SB)		2	0	0	2
Matching Verbs (SV)		0	2	0	2
<b>Words in Context</b>		5	3	0	8
Words in Context (W)					
<b>Command of Evidence</b>		6	2	0	8
Command of Evidence (E)					
<b>Analysis in History/Social Studies</b>		2	4	0	6
History and Social Studies (AH)					



Writing Questions Breakdown (Continued)					
Category/Topic		Correct	Incorrect	Omitted	Total
Analysis in Science	<div></div>	6	0	0	6
Science (AS)					

Math: 770



Section	Correct	Incorrect	Omitted	Total	Scaled Score
No-Calculator	18	2	0	20	
Calculator	38	0	0	38	77

No-Calculator Section Breakdown






















Subject Area		Correct	Incorrect	Omitted	Total
Heart of Algebra		9	0	0	9
Passport to Advanced Math		7	1	0	8
Additional Topics in Math		2	1	0	3






















Answers														
Question:	1	2	3	4	5	6	7	8	9	10	11	12	13	14
Your Answer:	C	C	B	D	A	C	B	C	B	B	B	B	D	A
Correct Answer:	C	C	B	D	A	C	B	C	B	B	D	B	D	A
Topic:	H6	H1	H12	A15	P14	H5	P12	H5	H15	P7	P2	P17	P4	H15
Difficulty:	1	1	2	4	3	2	3	3	2	3	3	3	3	3
Question:	15	16	17	18	19	20								
Your Answer:	D	8	60	4	8	6632								
Correct Answer:	D	8	30	4	8	6632								
Topic:	P5	H2	A3	A12	H7	P4								
Difficulty:	2	2	2	4	3	2								

Calculator Section Breakdown

Subject Area		Correct	Incorrect	Omitted	Total
Heart of Algebra	<div></div>	10	0	0	10
Problem Solving and Data Analysis	<div></div>	16	0	0	16
Passport to Advanced Math	<div></div>	7	0	0	7
Additional Topics in Math	<div></div>	5	0	0	5

Answers														
Question:	1	2	3	4	5	6	7	8	9	10	11	12	13	14
Your Answer:	B	A	C	D	C	C	A	C	A	D	A	B	B	D
Correct Answer:	B	A	C	D	C	C	A	C	A	D	A	B	B	D
Topic:	D1	P4	D3	D18	H18	P5	D12	D14	H1	D3	H10	D4	D12	A6
Difficulty:	2	2	1	2	2	3	2	3	3	2	2	2	3	2
Question:	15	16	17	18	19	20	21	22	23	24	25	26	27	28
Your Answer:	B	D	A	B	A	C	C	B	C	A	B	B	A	C
Correct Answer:	B	D	A	B	A	C	C	B	C	A	B	B	A	C
Topic:	D1	H12	H6	D14	P1	P2	D14	D7	A2	P15	H5	H8	P13	H8
Difficulty:	3	3	2	3	2	3	4	3	2	2	2	2	3	2
Question:	29	30	31	32	33	34	35	36	37	38				
Your Answer:	D	B	195	.4	30	5/18	0	6	2.4	5/7				
Correct Answer:	D	B	195	2/5 or .400...	30	5/18 or .278...	0 or 3...	6	12/5 or 2.40...	5/7 or .714...				
Topic:	A14	D4	D3	H9	H10	A11	P9	A9	D7	D15				
Difficulty:	3	3	2	3	3	2	4	4	3	4				

Math Questions Breakdown					
Category/Topic		Correct	Incorrect	Omitted	Total
<b>Heart of Algebra</b>		19	0	0	19
Solution Sets of Linear Inequalities (H18)		1	0	0	1
Solve Systems of Equations (H12)		2	0	0	2
Create Linear Functions Given Slope or Points (H9)		1	0	0	1
Graphs and Tables of Linear Functions (H8)		2	0	0	2
Create Linear Equations (H1)		2	0	0	2
Solve Linear Equations (H2)		1	0	0	1
Input/Output Pairs for Linear Functions (H7)		1	0	0	1
Create Systems of Equations in Context (H10)		2	0	0	2
Model with and Create Linear Functions (H5)		3	0	0	3
Interpret Linear Functions (H6)		2	0	0	2
Create Linear Inequalities (H15)		2	0	0	2
<b>Problem Solving and Data Analysis</b>		16	0	0	16
Measures of Centre and Spread (D7)		2	0	0	2
Estimate and Use a Line of Best Fit (D14)		3	0	0	3
Interpret 2-Variable Graphs (D12)		2	0	0	2
Probability (D15)		1	0	0	1
Unit Conversion (D3)		3	0	0	3
Interpret Sample Results to a Population (D18)		1	0	0	1
Percentages (D4)		2	0	0	2
Ratios, Rates, and Units (D1)		2	0	0	2

Math Questions Breakdown (Continued)					
Category/Topic		Correct	Incorrect	Omitted	Total
<b>Passport to Advanced Math</b>		14	1	0	15
Rewrite Rational Expressions (P1)		1	0	0	1
Solve Factored Polynomials (P7)		1	0	0	1
Solve Systems of Nonlinear Equations (P9)		1	0	0	1
Graphs and Tables of Nonlinear Functions (P17)		1	0	0	1
Operations on Polynomials (P4)		3	0	0	3
Rewrite Radical Expressions (P2)		1	1	0	2
Nonlinear Function Notation (P14)		1	0	0	1
The Quadratic Formula (P12)		1	0	0	1
Solve Quadratics by Factoring (P5)		2	0	0	2
Interpret Nonlinear Functions (P15)		1	0	0	1
Create and Use Nonlinear Functions (P13)		1	0	0	1
<b>Additional Topics in Math</b>		7	1	0	8
Complex Numbers (A15)		1	0	0	1
Equations of Circles (A14)		1	0	0	1
Triangle Theorems and Similarity (A3)		0	1	0	1
Area and Volume Formulae (A2)		1	0	0	1
Circle Theorems and Properties (A11)		1	0	0	1
Angle and Line Theorems (A6)		1	0	0	1
Similar Triangle Trigonometry (A9)		1	0	0	1
Radians and Degrees (A12)		1	0	0	1

## Question Topics

The following tables list the types of questions that appear in every section of the test.

Reading Section		
Code	Description	Example
IA	<b>Similar Situation:</b> Identify a situation that is similar to one described in the passage	"Which of the following situations is most analogous to the role of sharks presented in lines 31-36?"
IC	<b>Finding Evidence:</b> Find lines in the passage that support your answer to a previous question	"Which choice provides the best evidence for the answer to the previous question?"
IE	<b>Direct Information:</b> Find information stated directly in the passage	"According to the passage, which of the following claims is true about American scrap metal?"
II	<b>Implied Information:</b> Find information stated indirectly in the passage	"It can reasonably be inferred from the passage that the narrator ..."
IR	<b>Describing Relationships:</b> Determine how two people or items discussed in a passage interact with one another	"Based on the passage, which choice best describes the relationship between novice and expert writers?"
IS	<b>Summarizing:</b> Identify a summary for a part of the passage	"Which of the following provides the most reasonable summary of the passage?"
IT	<b>Main Ideas:</b> Identify the main ideas in a passage	"The passage primarily focuses on which of the following characteristics of atomic warfare?"
IW	<b>Vocabulary in Context:</b> Choose an appropriate synonym for a word or phrase used in the passage	"As used in line 74, "intact" most nearly means ..."
M	<b>Comparing Passages:</b> Compare or contrast information from two passages in a passage pair	"Both Passage 1 and Passage 2 include..."
Q	<b>Graphics:</b> Find information in a graphic or how it relates to a passage	"The passage and table most strongly support which of the following conclusions?"
RC	<b>Finding Arguments:</b> Identify arguments and counterarguments made in a passage	"In this speech, Roosevelt does which of the following to promote his administration?"
RE	<b>Author's Evidence:</b> Identify what evidence the author uses to support arguments	"The author of Passage 1 supports his assertion that, despite some errors, genome sequencing is already accurate enough to be used by ..."
RO	<b>Overall Structure:</b> Identify the overall structure of an entire passage	"Which of the following best describes the passage?"
RP	<b>Purpose:</b> Identify what a portion of a passage is trying to accomplish	"The last two lines (76-77) primarily serve to ..."
RPW	<b>Internal Structure:</b> Determine how one part of the passage relates to the rest of the passage	"The first paragraph introduces the passage by ..."
RR	<b>Author's Reasoning:</b> Assess the reasoning used to make arguments in a passage	"In lines 62-65, what is the most likely reason that the author describes why females may be more at risk during changes in community structure?"

Reading Section (Continued)		
Code	Description	Example
RV	<b>Point of View:</b> Determine the author's point of view	"The stance the author takes in the passage is best described as that of ..."
RW	<b>Word Choice:</b> Determine how certain words influence the meaning of the text	"The main rhetorical effect of lines 17-23 is to ..."
Code	Description	
E	<b>Command of Evidence:</b> Questions that require you to consider the use of evidence in the passage, including adding, revising, or reordering pieces of evidence. Main Idea, Support, Relevant Information, and Graphic Analysis questions will most commonly be counted towards Command of Evidence.	
W	<b>Words in Context:</b> Questions that require you to interpret or revise challenging vocabulary words in the context of the passage. Precise Word Choice questions always contribute to your Words in Context score, but so can many other question types if the question requires you to interpret a difficult word or use a common word in a challenging way.	
AH	<b>History and Social Studies:</b> All Expression of Ideas questions on Social Studies/History passages will contribute to your Social Studies/History score.	
AS	<b>Science:</b> All Expression of Ideas questions on Science passages will contribute to your Science score.	

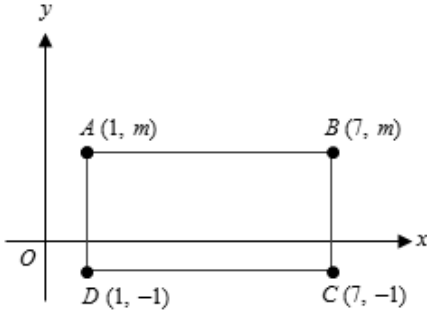
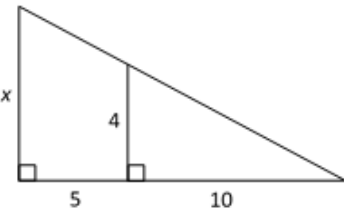
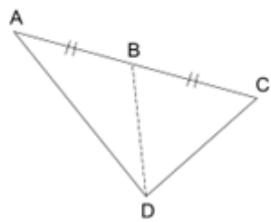
Writing and Language Section		
Code	Description	Example
DF	<b>Relevant Information:</b> Asks about whether information contributes to the main	"Which of the following changes would most improve the focus of the passage?"
DP	<b>Main Idea:</b> Asks about adding, revising, or deleting a main idea statement in the passage	"Which choice most effectively conveys the main topic of the paragraph?"
DQ	<b>Graphic Analysis:</b> Asks about information presented in charts and graphs	"Which of the following choices completes the sentence with accurate information from the graphic?"
DS	<b>Supporting Evidence:</b> Asks about changing, inserting, or deleting supporting evidence for an idea	"Which of the following sentences, inserted here, most effectively supports the claim made in the previous sentence?"
EC	<b>Concise Sentences:</b> Asks you to pick an option that eliminates empty phrases and repetitive words but not key information	"Perhaps most impressively, al-Razi conducted one of history's earliest clinical trials to study <u>how effective the practice of bloodletting was</u> as a cure for disease."
EP	<b>Precise Word Choices:</b> Asks you to choose the vocabulary word that makes the most sense in context	"In the Middle East, <u>aesthetic</u> ideals from Cynicism influenced early Christians, leading some to give up their possessions to live in poverty in the desert."
ES	<b>Clear Sentences:</b> Asks for you to pick effective order and arrangement of words, and use a variety of sentence structures for specific goals	"Which choice best combines the sentences at the underlined portion?"
ET	<b>Style and Tone:</b> Asks for you to pick the option that maintains the same style and tone as the rest of the passage	"This education helps them <u>learn a lot of stuff about</u> biology and chemistry so that they can understand the human body and the effects that various nutrients can have on overall health."
OL	<b>Logical Sentence Order:</b> Asks about reordering sentences or paragraphs to make the passage more logical	"To make this paragraph most logical, sentence 4 should be placed..."

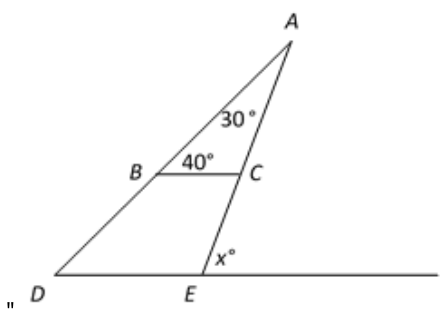
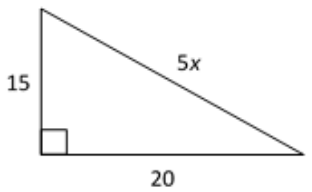
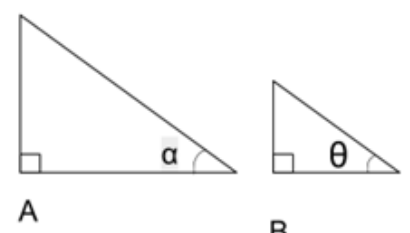
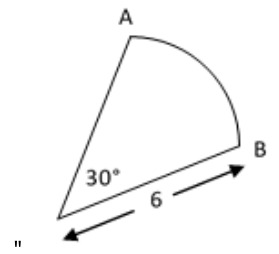
OT	<b>Transitional Words and Sentences:</b> Asks about the best transitional words and phrases to connect sentences and paragraphs	" <u>However, ancient</u> Greek philosophers held a great diversity of opinions, founding many schools of thought that have shaped the development of culture in the West and beyond."
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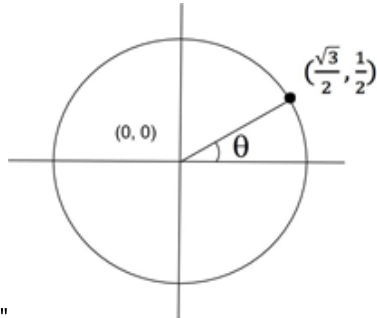


Writing and Language Section (Continued)		
Code	Description	Example
PC	<b>Extra Clauses:</b> Asks you to correct problems with various types of nonessential clauses that provide extra information in a sentence	"The Persian mathematician <u>al-Khwarizmi who worked in the 9th century CE developed</u> new methods for solving linear and quadratic equations."
PE	<b>Ending a Sentence:</b> Asks you to select the correct punctuation to end a sentence while conveying its intended meaning	"Spending on recreation and luxuries isn't necessarily waste; things that make us happy have value because they make us happy. However, we must ask ourselves an important question: "What is a reasonable level of spending on these budget <u>items!</u> "
PL	<b>Punctuating a List:</b> Asks you to correctly punctuate a list of items	"One of the foremost applications of this technology is the creation of plants that are resistant to <u>certain pests, diseases, and herbicides.</u> "
PP	<b>Making Possessives:</b> Asks you to correctly create the possessive form of a noun or pronoun, and avoid placing apostrophes or the letter 's' incorrectly on non-possessive forms.	"Cars are often singled out in conversations about carbon dioxide, but the largest <u>source's</u> of carbon dioxide emissions in the U.S. are actually power plants."
PU	<b>Unnecessary Punctuation:</b> Asks for you to remove unnecessary punctuation	"The Stoics, unlike the Epicureans, believed that a <u>divine will they called</u> the logos influenced all events."
PW	<b>Punctuating a Sentence:</b> Asks you to correct various errors of punctuation that occur between clauses or items within a sentence	"Cities are filled <u>with lights: streetlights, headlights,</u> neon signs, LED screens with flashing ads, spotlights shining against landmark buildings, and countless glowing windows and screens, all drowning out the relatively dim twinkle of the stars, which are all but invisible in city skies"
SB	<b>Making Whole Sentences and Avoiding Run-ons:</b> Asks for you to correct run-on sentences and sentence fragments by joining or dividing sentences and clauses, or changing the way they're joined or divided.	"Typically, scientists modify plants by creating a ring of DNA called a plasmid, which holds the <u>desired genes, then they</u> insert this plasmid into plant cells."
SM	<b>Where to Put Descriptive Phrases:</b> Asks for you to place descriptive phrases next to the things they're supposed to describe	"Teaching classes on dietetics to university students, <u>new dietitians are also trained by them.</u> "
SN	<b>Matching Nouns:</b> Asks you to recognize errors in the person - "I" vs. "you" or "him" -- and number -- "they" vs. "he" -- of a pronoun	"Nora Roberts is one of the most prolific living Writers; <u>they</u> began writing in 1979, publishing over 200 romance novels to date. "
SP	<b>Matching Sentence Structures:</b> Asks for you to make sure that different parts of a sentence or paragraph have the same structure when they need to	"For instance, GM crops could outcompete wild plants, give rise to toxin-resistant pests, or <u>disrupting</u> an ecosystem's food chain by damaging insect populations."
SS	<b>Joining Sentences with Conjunctions:</b> Asks for you to correct errors with subordinating and coordinating conjunctions, and the kinds of clauses the make	"Although the Fuji apple shares its name with the well-known Mt. Fuji, <u>but it is actually named</u> after Fujisaki, the town where researchers developed the hybrid."
SV	<b>Matching Verbs:</b> Asks for you to make sure that verbs maintain the same form or an appropriate form throughout a sentence or paragraph	"Using their wide range of knowledge and skills, these professionals ensure that their clients and patients eat nutritious foods and <u>living</u> lifestyles that will help them be fit and healthy."

Writing and Language Section (Continued)		
Code	Description	Example
UC	<b>Appropriate Prepositions:</b> Asks you to select the correct preposition or idiom to convey the intended meaning of a sentence	"Had they not preserved ancient knowledge and <u>elaborated on</u> it with their own findings, scientific and technological development might be centuries behind where it is today."
UD	<b>Making Possessives:</b> Asks for you to select a word to show possession that agrees with the form of the word that identifies the owner	"While Japanese consumers strongly prefer Japanese apples to American apples, <u>its</u> most popular variety—the Fuji apple—is actually a hybrid of two American varieties."
UF	<b>Confusing Words:</b> Asks you to select the correct choice from a pair of frequently confused words, like "their" and "they're," and usually to correct a small second error	"The Ouroboros is an ancient symbol, which depicts a snake <u>eating its</u> own tail."
UL	<b>Comparing Correctly:</b> Asks you to correct sentences in which unlike objects are compared	"While the amount in the U.S. Federal budget for defense is consistently greater than <u>education</u> , adding in state and local spending reveals a greater overall expenditure on education than defense."
UN	<b>Noun Agreement:</b> Asks for you to identify cases in which a noun should be plural or singular, and is the opposite	"There are hundreds of pieces of space debris orbiting Earth, and any one of them could be <u>dangerous projectiles</u> ."
UPA	<b>Pronoun Agreement:</b> Asks for you to select the pronoun that agrees with the noun to which it refers	"Even though there is a clear scientific consensus that food derived from GM crops is safe for human consumption, much of the general public fears that <u>it</u> might pose unknown health risks."
UPC	<b>Clear Pronouns:</b> Asks you to substitute the correct noun for a pronoun when the pronoun is potentially unclear	"Darwin and Wallace both independently arrived at similar theories, but today <u>he</u> is chiefly remembered as the author of theory of Evolution by Natural Selection. Wallace is remembered chiefly as a defender of Darwin's work."
USV	<b>Verb Agreement:</b> Asks for you to select the verb that agrees with the form of the subject, the noun that is 'doing' the action of the verb	"The history of science as it is taught to most Western students <u>are</u> tragically incomplete."
Code	Description	
E	<b>Command of Evidence:</b> Questions that require you to consider the use of evidence in the passage, including adding, revising, or reordering pieces of evidence. Main Idea, Support, Relevant Information, and Graphic Analysis questions will most commonly be counted towards Command of Evidence.	
W	<b>Words in Context:</b> Questions that require you to interpret or revise challenging vocabulary words in the context of the passage. Precise Word Choice questions always contribute to your Words in Context score, but so can many other question types if the question requires you to interpret a difficult word or use a common word in a challenging way.	
AH	<b>History and Social Studies:</b> All Expression of Ideas questions on Social Studies/History passages will contribute to your Social Studies/History score.	
AS	<b>Science:</b> All Expression of Ideas questions on Science passages will contribute to your Science score.	

Math Section		
Code	Description	Example
A1	<b>Scale Factors of Figures:</b> Apply knowledge that changing a geometric figure by a scale factor of $k$ changes all lengths by a factor of $k$ , changes all areas by a factor of $k$ squared, and changes all volumes by a factor of $k$ cubed.	"How many cubic centimeters are in one cubic meter?"
A2	<b>Area and Volume Formulae:</b> Select the correct area or volume formula and calculate a specified value.	<div></div> <p>The rectangle <math>ABCD</math> is placed on a coordinate grid as shown in the figure above. If the area of the rectangle is 24, what is the value of <math>m</math>?"</p>
A3	<b>Triangle Theorems and Similarity:</b> Apply concepts and theorems related to congruence and similarity of triangles, and the triangle sum theorem.	<div></div> <p>In the diagram above, what is the length of the side <math>x</math>? (Note: Diagram is not to scale.)"</p>
A4	<b>Assess Conditions for Relationships or Theorems:</b> Determine which statements may be required to prove certain relationships or to satisfy a given theorem.	<div></div> <p>Given <math>\triangle ABC</math> above, which of the following is true?</p> <div><p>I. <math>\angle ABD</math> and <math>\angle CBD</math> total <math>180^\circ</math></p><p>II. <math>B</math> is the midpoint of <math>\overline{AC}</math></p><p>III. <math>\angle CDB</math> and <math>\angle ADB</math> total <math>90^\circ</math></p></div>
A5	<b>Scaling Triangles:</b> Apply knowledge that changing a triangle by a scale factor of $k$ changes all lengths by a factor of $k$ , but does not change angle measures.	"A triangle has sides of length 3, 5, and 6. If the length of each side is increased by a factor of $\frac{2}{3}$ which of the following is true?"

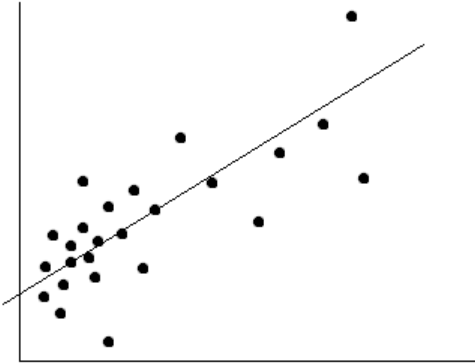
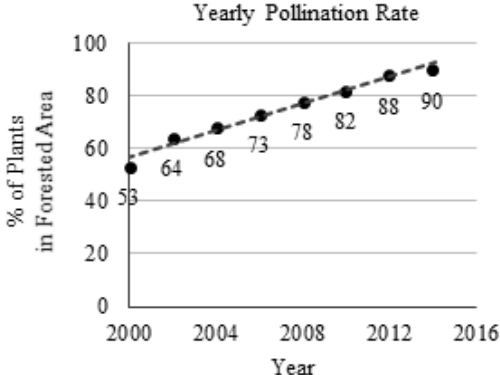
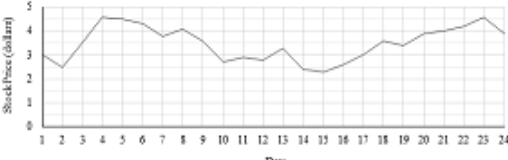
Math Section (Continued)		
Code	Description	Example
A6	<b>Angle and Line Theorems:</b> Apply concepts and theorems related to lines and angles.	 <p>In the figure above, if <math>BC \parallel DE</math>, what is the value of <math>x</math>?"</p>
A7	<b>The Pythagorean Theorem:</b> Apply the Pythagorean Theorem.	 <p>What is the value of <math>x</math>, given the triangle above?"</p>
A8	<b>Right Triangle Trigonometry:</b> Solve problems using right triangle trigonometry, including special triangles.	<p>"If the sine of angle <math>x</math> is <math>\frac{4}{5}</math>, what is the tangent of <math>x</math>?"</p>
A9	<b>Similar Triangle Trigonometry:</b> Use similarity to calculate values of sine, cosine, and tangent.	 <p>If <math>A</math> and <math>B</math> are similar and <math>\sin(\alpha) = \frac{3}{5}</math>, what is <math>\cos(\theta)</math>?"</p>
A10	<b>Trig Ratios of Complementary Angles:</b> Solve problems using the relationship between the sine and cosine of complementary angles.	<p>"A right triangle has <math>\theta</math> and <math>\alpha</math> as its two non-right angles. If <math>\sin(\alpha) = x</math>, which of the following is not always true?"</p>
A11	<b>Circle Theorems and Properties:</b> Use definitions, properties, and theorems relating to circles and parts of circles to solve problems.	 <p>What is the length of arc <math>AB</math> in the figure above?"</p>
A12	<b>Radians and Degrees:</b> Solve problems using radian measure, and convert between radians and degrees.	<p>"The windshield wipers on Soojeong's car sweep an angle of <math>\frac{1}{6}\pi</math> radians and are 20 inches long. If there are two wipers on the windshield and they do not overlap, what is the area that the wipers can clear, to the nearest square inch?"</p>

Math Section (Continued)																										
Code	Description	Example																								
A13	<b>Unit Circle Trigonometry:</b> Solve problems using trigonometric ratios in the unit circle.	<div></div> <p>"</p> <p>What is the value of <math>90^\circ - \theta</math>?"</p>																								
A14	<b>Equations of Circles:</b> Solve problems related to the graphs and equations of circles in the xy-plane, including completing the square to determine properties of the circle.	<p>"</p> $x^2 + 2x + y^2 - 8y + 8 = 0$ <p>What is the radius of the circle described by the above equation? "</p>																								
A15	<b>Complex Numbers:</b> Add, subtract, multiply, and divide complex numbers, including solving problems.	<p>"</p> $\frac{4 + 2i}{1 - i}$ <p>If <math>i = \sqrt{-1}</math>, which of the following is equivalent to the expression above? "</p>																								
D1	<b>Ratios, Rates, and Units:</b> Apply proportional relationships, ratios, rates, and units in a wide variety of contexts.	"The ratio of $d : c$ is 3 : 1. If the sum of $d$ and $c$ is $s$ , what is the value of $d$ , in terms of $s$ ?"																								
D2	<b>Compound Units:</b> Solve problems involving derived units.	"A company wants to create a solution of pure ethanol and distilled water. The density of ethanol is 0.789 grams per cubic centimeter, and the density of water is 1 gram per cubic centimeter. If the company combines 8 cubic centimeters of ethanol with 4 cubic centimeters of water, what is the resulting density of the solution, in grams per cubic centimeter, to the nearest one thousandth? (Density is mass divided by volume.) "																								
D3	<b>Unit Conversion:</b> Solve problems involving unit conversion.	"A specific type of eel has been found to measure between 50 centimeters and 90 centimeters long. Given this information, which of the following measurements could be the length of an eel? (Note: 1 inch = 2.54 centimeters)"																								
D4	<b>Percentages:</b> Solve problems using percentages, including percent increases and decreases.	"If $x$ is 60 of $y$ , and $y$ is 30 of $z$ , $x$ is what percent of $z$ ? (Note: Disregard the percent symbol when entering your answer.)"																								
D5	<b>Choose an Appropriate 1-Variable Graph:</b> Choose an appropriate graphical representation for a given data set.	<p>"</p> <table><tr><th></th><th><i>Bipolar</i></th><th><i>Unipolar</i></th><th><i>Multipolar</i></th><th><i>Pyramidal</i></th><th><i>Unknown</i></th></tr><tr><td><i>Sample1</i></td><td>512</td><td>718</td><td>659</td><td>88</td><td>121</td></tr><tr><td><i>Sample2</i></td><td>126</td><td>901</td><td>992</td><td>132</td><td>225</td></tr><tr><td><i>Sample3</i></td><td>93</td><td>150</td><td>121</td><td>1024</td><td>149</td></tr></table> <p>A neuroscientist has classified a number of neurons into the</p>		<i>Bipolar</i>	<i>Unipolar</i>	<i>Multipolar</i>	<i>Pyramidal</i>	<i>Unknown</i>	<i>Sample1</i>	512	718	659	88	121	<i>Sample2</i>	126	901	992	132	225	<i>Sample3</i>	93	150	121	1024	149
	<i>Bipolar</i>	<i>Unipolar</i>	<i>Multipolar</i>	<i>Pyramidal</i>	<i>Unknown</i>																					
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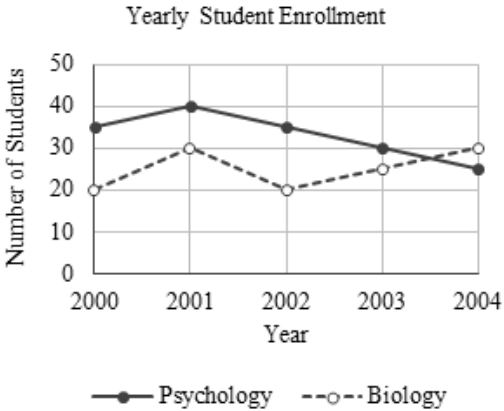
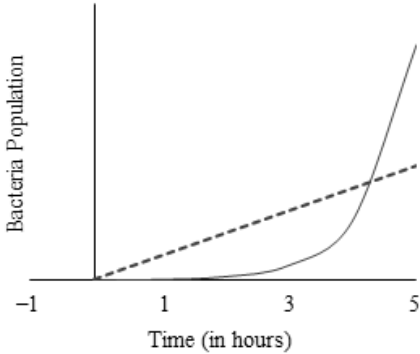

categories above. What type of graph would be most appropriate for these data?"

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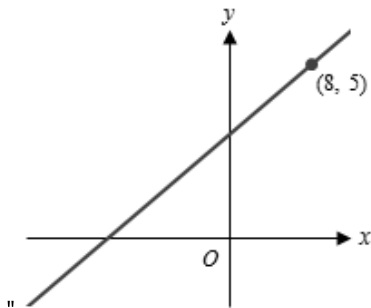
Math Section (Continued)																	
Code	Description	Example															
D6	<b>Interpret 1-Variable Graphs:</b> Interpret information from a given representation of data in context, including frequency tables, histograms, and boxplots.	<p><b>Change in Teens' Physical Activity</b></p> <table border="1"><caption>Data for Change in Teens' Physical Activity</caption><thead><tr><th>Group</th><th>Pre-Experiment (minutes per week)</th><th>Post-Experiment (minutes per week)</th></tr></thead><tbody><tr><td>Sports Team</td><td>160</td><td>200</td></tr><tr><td>Sharing Goals</td><td>160</td><td>260</td></tr><tr><td>App</td><td>160</td><td>240</td></tr><tr><td>Control</td><td>160</td><td>180</td></tr></tbody></table> <p>A psychologist conducted a study to compare different methods of encouraging teenagers to participate in physical activities. The three methods studied were obligatory participation on a sports team, sharing personal goals with a friend, and recording physical activity on an interactive smartphone app. Participants were randomly assigned to one of these methods or a control group. The study measured the participants' increase in physical activity one month after the experiment. The results are shown in the bar graph above. Which of the following statements is supported by the graph? "</p>	Group	Pre-Experiment (minutes per week)	Post-Experiment (minutes per week)	Sports Team	160	200	Sharing Goals	160	260	App	160	240	Control	160	180
Group	Pre-Experiment (minutes per week)	Post-Experiment (minutes per week)															
Sports Team	160	200															
Sharing Goals	160	260															
App	160	240															
Control	160	180															
D7	<b>Measures of Centre and Spread:</b> Calculate, compare, and interpret mean, median, and range. Compare and interpret (but don't calculate) standard deviation.	<p>"</p> <p><i>DataSetA</i>: 1, 1, 2, 4, 4, 6</p> <p><i>SetB</i>: 2, 2, 3, 3, 5</p> <p>Which of the following statements is supported by the information provided above?</p> <p>A. Data Set A has a larger mean than Data Set B; Data Set A has a larger standard deviation than Data Set B.</p> <p>B. Data Set A has a larger mean than Data Set B; Data Set A has a smaller standard deviation than Data Set B.</p> <p>C. Data Set A and Data Set B have the same mean; Data Set A has a larger standard deviation than Data Set B.</p> <p>D. Data Set A and Data Set B have the same mean; Data Set A has a smaller standard deviation than Data Set B.</p> <p>"</p>															
D8	<b>Effect of Outliers:</b> Describe the effect of outliers on mean and median.	<p>"A botanist measures twenty saplings and finds that they are all between 100 and 200 centimeters tall. If a tree that measures 15 meters tall were added to this data set, what would be the effect on the mean and median?"</p>															

Math Section (Continued)		
Code	Description	Example
D9	<b>Compare Predicted Values to Actual Values:</b> Using a model that fits the data in a scatterplot, compare values predicted by the model to values in the data set.	<div></div> <p>"</p> <p>If the data above can be approximated by the line <math>y = \frac{2}{3}x + 4</math>, which of the following would be a reasonable data point to predict?"</p>
D10	<b>Interpret Lines of Best Fit:</b> Interpret the slope and intercepts of a line of best fit in context.	<div></div> <p>"</p> <p>The graph above shows the pollination rate of plants in a certain forested area. Based on the line of best fit, what is the average annual increase, in percentage points, in the pollination rate?"</p>
D11	<b>Choose an Appropriate 2-Variable Graph:</b> Select a graph that represents a context, identify a value on a graph, or interpret information on the graph.	<p>"The graph below shows the stock price for a company in the first 24 days of April.</p> <div></div> <p>On what day of the month was the company's stock worth the least? "</p>



Math Section (Continued)		
Code	Description	Example
D12	<b>Interpret 2-Variable Graphs:</b> Analyze and interpret data represented in a scatterplot or line graph; fit linear, quadratic, and exponential models.	<p>Yearly Student Enrollment</p>  <p>What is the total number of students who enrolled in the psychology class during the period from 2000 to 2002, inclusive? "</p>
D13	<b>Compare Linear and Exponential Growth:</b> Compare linear and exponential growth.	<p>Growth of Bacteria Populations</p>  <p>The population of Bacteria A is represented by the solid line and the population of Bacteria B is represented by the dotted line in the graph shown above. Which of the following statements is true?"</p>
D14	<b>Estimate and Use a Line of Best Fit:</b> Estimate the line of best fit for a given scatterplot; use the line to make predictions.	<p>Yearly Number of Businesses</p>  <p>City planners in Beaufort, South Carolina want to estimate the number of businesses in 2015 from data collected from 2005 to 2011. The number of businesses in the city during this period is graphed above. Using the line of best fit, what is the best estimate for the number of businesses in Beaufort operating in 2015? "</p>

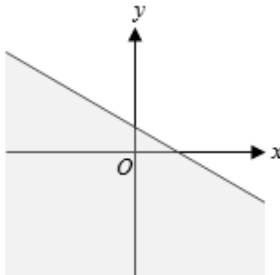
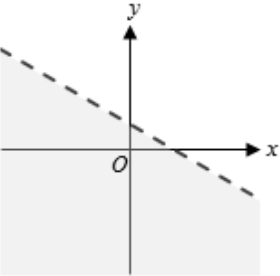
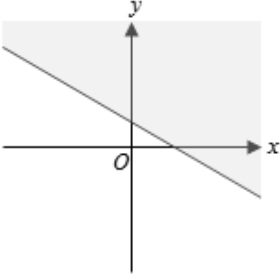
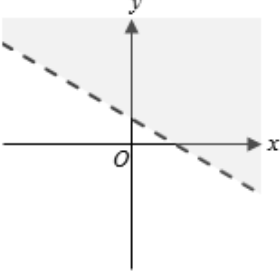
Math Section (Continued)								
Code	Description	Example						
D15	<b>Probability:</b> Calculate and interpret probability and conditional probability.	"A group of 11 people are travelling together. Two people are from France, seven are from England, and two are from China. Unfortunately, their travel agent only booked 9 tickets, and two people have to leave the group. The group decides to pick two people at random by drawing lots. If the first person chosen is from England, what is the percentage chance that the second person will also be from England? "						
D16	<b>Use Sample Data to Infer Population Data:</b> Use sample mean and sample proportion to estimate population mean and population proportion.	<p>"</p> <table border="1"> <thead> <tr> <th>Coffee</th><th>Tea</th><th>Neither</th></tr> </thead> <tbody> <tr> <td>24</td><td>10</td><td>6</td></tr> </tbody> </table> <p>In an office of 200 people, 40 employees were randomly selected and surveyed about whether they drank coffee or tea. The results are displayed in the table above. Based on the results of this survey, how many employees most likely drink coffee?"</p>	Coffee	Tea	Neither	24	10	6
Coffee	Tea	Neither						
24	10	6						
D17	<b>Interpret Margin of Error:</b> Interpret margin of error; understand that a larger sample size generally leads to a smaller margin of error.	"Two scientists are attempting to determine the age of a granite formation in the Scottish Highlands. The first scientist samples granite from 10 random sites in the Highlands and concludes that the granite is $600 \pm 60$ million years old. If the second scientist wants to obtain a margin of error that is smaller than the first scientist's, which of the following would be the best number of random samples to take?"						
D18	<b>Interpret Sample Results to a Population:</b> With random samples, understand why a result can be extended only to the population from which the sample was selected.	"A survey was taken at a children's arcade in which children were asked which superhero was their favorite. The surveyors would like to extend their results to a more general population. To which of the following populations could the results of the survey be reasonably applied?"						
D19	<b>Random Assignment:</b> Understand why random assignment provides evidence for a causal relationship.	"A group of scientists is testing a new skin cream to cure rashes. 100 people with rashes have volunteered to take part in the study. The scientists must select 50 of the 100 people to take the treatment; the remaining people make up the control group and do not take the treatment. What method of selecting these groups will be the most likely to lead to meaningful results from the trials?"						
H1	<b>Create Linear Equations:</b> Create and use LEIOV to solve problems in a variety of contexts, or interpret solutions in terms of the context.	"A barrel of crude oil is extracted from shale at a cost of $\$51$ , and then transported to and from the refinery at a cost of $\$6$ each direction. Oil is processed three times at the refinery plant, at a cost of $\$9$ each time. What is the profit, in dollars per barrel, if one barrel is sold for $\$93$ ? (Profit is equal to revenue minus expenses.)"						
H2	<b>Solve Linear Equations:</b> Solve a LEIOV.	"If $8x + 4 = 48$ , what is $2x + 1$ ?"						
H3	<b>Interpret Linear Equations:</b> For a LEIOV, interpret a constant, variable, factor, or term in a context.	"Niki is a test driver for an automobile manufacturer. Each morning, he receives a list of cars to test drive. The number of cars he has left to test drive at the end of each day can be modeled with the equation $C = 15 - 2h$ , where $C$ is the number of cars left and $h$ is the number of hours he has worked that day. What is the meaning of the value 2 in this equation?"						

Math Section (Continued)												
Code	Description	Example										
H4	<b>Number of Solutions for a Linear Equation:</b> For a LEIOV, determine the conditions under which the equation has no solutions, one solution, or infinitely many solutions.	"If $2x = ax - 3$ , and $a$ is equal to 2, how many solutions for $x$ exist for this equation? "										
H5	<b>Model with and Create Linear Functions:</b> Create and use LFs to solve problems in a variety of contexts, or model a relationship between quantities.	"John fills his bag with a number of five cent candies, $v$ , and ten cent candies, $t$ . If he has a total of 54 candies and his candies are worth \$3.10 in total, which of the following must be true?  I. $\$0.05v + \$0.10t = \$3.10$ II. $54 = v + t$ III. $\$0.05 \times (54 - v) + \$0.10v = \$3.10$  "										
H6	<b>Interpret Linear Functions:</b> For a LF that represents a context, interpret the meaning of an input/output pair, constant, variable, factor, or term.	"The population of Japan from 2007 to 2016 can be modeled by the equation $P(x) = 127.8 - 0.15x$ , where $P$ is the population of Japan in millions and $x$ is the number of years since 2007. Which of the following best describes the meaning of the number 0.15 in this equation?"										
H7	<b>Input/Output Pairs for Linear Functions:</b> For a LF that represents a context, given a value of one quantity in the relationship, find the other.	"If $f(x) = 2x - 4$ , $g(x) = f(2x)$ , and $g(x) = 4$ , what is $x$ ?"										
H8	<b>Graphs and Tables of Linear Functions:</b> Make connections between verbal, tabular, algebraic, and graphical representations of a LF.	" <table><tr><td><math>x</math></td><td>0</td><td>2</td><td>4</td><td>6</td></tr><tr><td><math>f(x)</math></td><td>3</td><td>4</td><td>5</td><td>6</td></tr></table> Which of the following expressions defines $f(x)$ in the table above? "	$x$	0	2	4	6	$f(x)$	3	4	5	6
$x$	0	2	4	6								
$f(x)$	3	4	5	6								
H9	<b>Create Linear Functions Given Slope or Points:</b> Create a LF given two input/output pairs or one input/output pair and the rate of change, or the rate of change of a perpendicular line.	 <p>"</p> <p>A line, shown in the graphic above, has a slope of <math>\frac{1}{4}</math> and passes through the point (8,5).What is the " <math>y</math>-intercept of this line?"</p>										
H10	<b>Create Systems of Equations in Context:</b> Create and use a SOTLEITV to solve problems in a variety of contexts, or interpret solutions in terms of the context.	"Joel is $a$ years older than Luca. In $b$ years, Joel will be twice as old as Luca. What is Joel's present age, in terms of $a$ and $b$ ?"										
H11	<b>Graphs and Tables of Systems of Equations:</b> Make connections between tabular, algebraic, and graphical representations of a SOTLEITV.	"Line $L$ passes through the points $(-3, 1)$ and $(1, 3)$ . Line $M$ passes through the points $(-2, 4)$ and $(7, 11)$ . If $L$ and $M$ intersect at the point $(x, y)$ , what is the value of $x + y$ ?"										

Math Section (Continued)		
Code	Description	Example
H12	<b>Solve Systems of Equations:</b> Solve a SOTLEITV.	<p>"</p> $s = 200 - 10x$ $l = 320 - 20x$ <p>In the equations above, <math>s</math> and <math>l</math> represent the number of bacteria in colonies of <i>staphylococcus</i> and <i>listeria</i>, respectively, that survive after the temperature is raised <math>x^\circ\text{C}</math> above <math>40^\circ\text{C}</math>. If there are as many surviving <i>staphylococcus</i> bacteria as surviving <i>listeria</i> bacteria, how many <i>listeria</i> bacteria are there?"</p>
H13	<b>Interpret Solutions of Systems of Equations:</b> For a SOTLEITV, interpret a solution, constant, variable, factor, or term based on the context.	"Line $L$ passes through the points $(-3, 1)$ and $(1, 3)$ . Line $M$ passes through the points $(2, -4)$ and $(7, 11)$ . If $L$ and $M$ intersect at the point $(x, y)$ , what is the value of $x + y$ ?"
H14	<b>Number of Solutions for a System of Equations:</b> For a SOTLEITV, determine the conditions under which the system has no solution, one solution, or infinitely many solutions.	<p>"</p> $2y = \frac{x}{5} - 1$ $y = \frac{2x + 8}{3}$ <p>What is the solution to the system of equations above?"</p>
H15	<b>Create Linear Inequalities:</b> Create and use LIIOOTV to solve problems in a variety of contexts, or interpret solutions in terms of the context.	"To ride on a roller coaster, a rider must be at least 3.5 feet tall and at most 6.5 feet tall. Which of the following inequalities represents the possible height $h$ , in feet, of a rider who can ride this roller coaster?"
H16	<b>Measures of Centre and Spread:</b> Calculate, compare, and interpret mean, median, and range. Compare and interpret (but don't calculate) standard deviation.	<p>"</p> <p><i>DataSetA</i>: 1, 1, 2, 4, 4, 6</p> <p><i>DataSetB</i>: 2, 2, 3, 3, 5</p> <p>Which of the following statements is supported by the information provided above?</p> <p>A) Data Set A has a larger mean than Data Set B; Data Set A has a larger standard deviation than Data Set B.</p> <p>B) Data Set A has a larger mean than Data Set B; Data Set A has a smaller standard deviation than Data Set B.</p> <p>C) Data Set A and Data Set B have the same mean; Data Set A has a larger standard deviation than Data Set B.</p> <p>D) Data Set A and Data Set B have the same mean; Data Set A has a smaller standard deviation than Data Set B."</p>
H16	<b>Interpret Linear Inequalities:</b> For LIIOOTV, interpret a constant, variable, factor, or term in a context.	<p>"If <math>x \leq 9</math> and <math>x \geq 1</math>, which of the following statements are true?</p> <p>I. <math>-9 \leq x \leq -1</math></p> <p>II. <math>1 \leq x \leq 9</math></p> <p>III. <math> x - 5  \leq 4</math></p> <p>"</p>

Math Section (Continued)

Code	Description	Example
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H17	<p><b>Graphs and Tables of Linear Inequalities:</b> Make connections between tabular, algebraic, and graphical representations of LIIOOTV.</p>	<div><p>"A)</p></div> <div><p>B)</p></div> <div><p>C)</p></div> <div><p>D)</p></div> <p>Which of the following diagrams could represent the inequality <math>y &lt; -\frac{1}{2}x + 2</math> in the <math>xy</math>-plane?"</p>
H18	<p><b>Solution Sets of Linear Inequalities:</b> Given a linear inequality or system of linear inequalities, interpret a point in the solution set.</p>	<p>"</p> <div><math display="block">4x &lt; 8</math><math display="block">-3x \leq 3</math></div> <p>What is the solution to the system of equations above?"</p>
P1	<p><b>Rewrite Rational Expressions:</b> Rewrite simple rational expressions.</p>	<div><p>"</p><math display="block">\frac{x-5}{x+2} - \frac{7}{x-2}</math><p>Which of the following is equivalent to the above expression?"</p></div>

Math Section (Continued)		
Code	Description	Example
P2	<b>Rewrite Radical Expressions:</b> Rewrite expressions with rational exponents and radicals.	"An anthropologist proposes that the change in a certain population can be modeled by the expression $\sqrt{9x^2 - 7x}$ . If $x$ is positive, which of the following is equivalent to this expression?"
P3	<b>Factor Polynomials:</b> Factor polynomials.	<p>"Which of the expressions below are equivalent to <math>5x^2 + 13x - 6</math>?"</p> <p>I. <math>(5x - 2)(x + 3)</math>            II. <math>(x - 2)(5x + 3)</math>            III. <math>5(x - 2)(x + 3)</math>            "</p>
P4	<b>Operations on Polynomials:</b> Add, subtract, and multiply polynomials.	<p><math>x^2 + 2x - 2</math>  <math>3x^2 - x - 1</math></p> <p>What is the product of the two expressions above? "</p>
P5	<b>Solve Quadratics by Factoring:</b> Solve quadratic equations in one variable by factoring; determine the conditions under which a quadratic equation has zero, one, or two real solutions.	"The $x$ -intercepts of the equation $y = x^2 + 2x - 24$ are $-a$ and $b$ , where both $a$ and $b$ are positive numbers. What is the value of $a - b$ ?"
P6	<b>Solve Rational/Radical Equations:</b> Solve simple rational and radical equations in one variable, including determining when a solution is extraneous.	"An object's mass in kilograms, $m$ , is represented by the equation $3\sqrt{m} - \sqrt{162} = 0$ . What is the object's mass in kilograms?"
P7	<b>Solve Factored Polynomials:</b> Solve polynomial equations (degree $> 2$ ) in one variable that are written in factored form.	<p><math>3x(x - 3)(x + 4) = 0</math></p> <p>Which of the following values of <math>x</math> is not a solution to the equation above? "</p>
P8	<b>Absolute Value:</b> Solve linear absolute value equations in one variable.	"A laser reflects off a mirror as shown below, according to the equation $y =  8x - 5 $ . At what value of $x$ does the laser strike the mirror?"
P9	<b>Solve Systems of Nonlinear Equations:</b> Solve systems of linear and nonlinear equations in two variables, including relating the solutions to the graphs of the equations.	<p><math>6y - 4x = 16</math>  <math>2y + x^2 = 12</math></p> <p>According to the system of equations above, if <math>x</math> is an integer, what is the value of <math>y - x</math>? "</p>
P10	<b>Interpret Nonlinear Equations:</b> For a nonlinear equation in one variable that represents a context, interpret a solution, constant, variable, factor, or term based on the context.	"The mass of a sample of Carbon-14, in kilograms, is given by the expression $50\left(\frac{1}{2}\right)^{\frac{x}{5730}}$ , where $x$ is the number of years that have passed since 1960. What is the meaning of the number 50 in this expression?"
P11	<b>Solve Nonlinear Equations for a Variable:</b> Given an equation or formula in two or more variables that represents a context, solve for the variable of interest.	<p>"</p> $v_t = \sqrt{\frac{2mg}{C\rho A}}$

The formula above gives the terminal velocity  $v_t$  for an object with mass  $m$  and area  $A$  falling due to the acceleration of gravity  $g$  through a medium with density  $\rho$  and a drag coefficient  $C$ . Which of the following gives  $A$  in terms of  $m$ ,  $g$ ,  $C$ ,  $\rho$ , and  $v_t$ ?

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Math Section (Continued)		
Code	Description	Example
P12	<b>The Quadratic Formula:</b> Solve quadratic equations in one variable by completing the square or using the quadratic formula.	"If $x = -3 - \sqrt{3}$ , which of the following expressions is equal to 0?"
P13	<b>Create and Use Nonlinear Functions:</b> Create and use quadratic or exponential functions to solve problems in a variety of contexts, or model a relationship between quantities.	"The population of an invasive species of moth doubles every 5 years. If the population in 2005 was 300, what will the population be in 2020?"
P14	<b>Nonlinear Function Notation:</b> Use function notation for a quadratic, polynomial, exponential, or rational function to represent and interpret input/output pairs and points on the graph.	"If $f(x) = x^2 - 5x + 1$ and $g(x) = f(2x)$ , what is $g(3)$ ?"
P15	<b>Interpret Nonlinear Functions:</b> For a quadratic or exponential function that represents a context, interpret the meaning of an input/output pair, constant, variable, factor, or term based on the context.	"The height of a falling ball is modeled using the quadratic function $h(t) = -t^2 - 3t + 20$ , where the height, $h$ , is in meters, and the time, $t$ , is in seconds. What is represented by the number 20 in this function?"
P16	<b>Suitable Forms of Nonlinear Functions:</b> For a quadratic or exponential function, determine the most suitable form of the expression to display key features of the context (e.g. initial value, extreme values, zeroes, doubling time).	" $y = x^2 + 2x + 6$ If the quadratic equation above is written in the form $y = (x - p)^2 + q$ , what is the value of $q$ ?"
P17	<b>Graphs and Tables of Nonlinear Functions:</b> For a quadratic, polynomial, exponential, or rational function, make connections between tabular, algebraic, and graphical representations.	" $f(x) = (x - 2)^2$ The function $f$ is shown above. Which of the following graphs represents $y = f(x) - 2$ ?"