

Test Content

This section provides detailed descriptions of the subject areas and the reasoning competencies assessed by *College BASE*, as well as selected sample questions. Each of the four subjects—English, mathematics, science, and social studies—is organized into levels of increasing specificity. Each subject is divided into two or more clusters; each cluster is made up of several closely related skills; and each skill is defined by two to six highly specific subskills.

English

College BASE divides English into two clusters: reading and literature, and writing. The reading and literature cluster evaluates your reading comprehension skills and your knowledge of major literary terms, genres, figures, and works, with emphasis on British and American literature. The writing cluster evaluates your pre-writing, composing, and revising skills through a combination of multiple-choice questions and an essay.

Cluster: Reading and Literature

The reading and literature cluster consists of three skills: reading critically, reading analytically, and understanding literature.

Skill 101

Read accurately and critically by asking pertinent questions about a text, by recognizing assumptions and implications, and by evaluating ideas.

Enabling Subskills

Ascertain the meaning of a passage, identifying main ideas, supporting details, and logical or narrative sequences.

Recognize the implicit assumptions and values underlying a written work.

Evaluate the ideas presented in a text by determining their logical validity, their implications, and their relationships to ideas beyond the text.

This skill focuses on interpretation and evaluation of relatively short reading passages selected from many fields of study and from many forms and styles of writing typical of that required in college courses. To demonstrate mastery of this skill, you must be able to identify main ideas and distinguish them from subordinate ideas and supporting details, to recognize assumptions and values that are unstated

but clearly implied, and to evaluate the logic or the underlying meaning of a passage. The following sample question illustrates one type of question that may be used to assess the first enabling subskill (i.e., identify main ideas).

Sample Question

Our crew employed themselves catching cod and hauled up a great number. Till then I had stuck to my resolution to eat nothing that had had life; and on this occasion I considered . . . the taking of every fish as a kind of unprovoked murder, since none of them had or ever could do us any injury that might justify this massacre. All this seemed very reasonable. But I had formerly been a great lover of fish, and when this came hot out of the frying pan, it smelled so admirably well. I balanced some time between principle and inclination till I recollected that when the fish were opened, I saw smaller fish taken out of their stomachs. “Then,” thought I, “if you eat one another, I don’t see why I mayn’t eat you.” So I dined upon cod very heartily. . . . So convenient a thing it is to be a reasonable creature, since it enables one to find or make a reason for everything one has a mind to do.

What is the main idea of this passage?

- A. Humans possess a limited capacity for compassion.
- * B. Humans possess an enormous capacity for self-justification.
- C. Because fish are carnivorous, humans are justified in eating them.
- D. Reason is the intellectual power separating humans from animals.

Like other questions assessing this skill, questions asking you to identify the main idea require you to go beyond information directly stated in the passage. In order to identify the main idea, for example, you must be able to separate other, less important ideas and supporting details. The correct answer will be the sentence that accurately describes the most important idea expressed by the author, regardless of whether that sentence appears in the passage itself. It will be neither too general nor too specific and will not introduce ideas that have not been discussed by the author.

For example, in the above passage, the narrator describes how he used his reasoning abilities in order to justify eating fish, although he had originally determined not to eat any living thing. The main idea, then, is best expressed in option B. Although the other options also present plausible statements, they do not accurately describe the most important idea of this passage. Option A brings to the passage something not discussed by the author (i.e., that taking life is a sign of a

lack of compassion). Option C gives too much emphasis to a subordinate idea (i.e., that fish are carnivorous). Option D is too general, since the passage is not about the characteristics that distinguish humans from animals.

Skill 102

Read a literary text analytically, seeing relationships between form and content.

Enabling Subskills

Identify and analyze common semantic features such as connotation and figures of speech.

Identify conventional literary genres, elements, and devices and relate such formal elements to the content of the passage in which they are found.

Identify the tone, mood, and voice of a literary text through an analysis of its linguistic features and literary devices.

Identify the theme of a literary text and the ways it is embodied by formal elements.

This skill focuses on your ability to analyze relatively short literary passages, including poetry, short stories, and essays typical of required reading in college literature courses. To demonstrate mastery of this skill, you must recognize relationships between what is said (content) and how it is expressed (form). You should be familiar with the basic language of literary study and recognize certain formal elements used in various types of literature. Questions may take a number of different forms. For example, you may be asked to find an example of a metaphor or pun in a given passage, to identify the connotation of a word or phrase, or to select the literary term that best describes a given example. The sample question below illustrates one type of question that may be used to assess the third enabling subskill (i.e., identify the tone of a literary passage).

Sample Question

Our crew employed themselves catching cod and hauled up a great number. Till then I had stuck to my resolution to eat nothing that had had life; and on this occasion I considered . . . the taking of every fish as a kind of unprovoked murder, since none of them had or ever could do us any injury that might justify this massacre. All this seemed very reasonable. But I had formerly been a great lover of fish, and when this came hot out of the frying pan, it smelled so admirably well. I balanced some time between principle and inclination till I recollected that when the fish were opened, I saw smaller fish taken out of their stomachs. "Then,"

thought I, "if you eat one another, I don't see why I mayn't eat you." So I dined upon cod very heartily. . . . So convenient a thing it is to be a reasonable creature, since it enables one to find or make a reason for everything one has a mind to do.

What is the tone of the last sentence?

- A. bitter
 - B. proud
 - * C. ironic
 - D. hopeful
-

You will notice that this question is based on the same reading passage as the first sample question. Frequently, two or more questions are based on a single passage.

Like other questions assessing this skill, questions asking you to identify tone require that you analyze how the author's choice of words and their arrangement into sentences determines the meaning or effect of a passage. For example, to identify the author's attitude toward the subject (i.e., tone), you could compare the author's choice of words to the subject as a whole. In this passage, you will notice that the words in the last sentence are impersonal and abstract. You will also notice that the passage contains few contractions or concrete nouns. This rather dramatic contrast between the formal level of diction and the subject of the passage (i.e., eating fish) indicates an ironic tone. Thus, C is the correct answer. Although the other options also describe possible attitudes toward the subject, they do not describe attitudes supported by this particular passage.

Skill 103

Understand a range of literature, rich in quality and representative of different literary forms and historical contexts.

Enabling Subskills

Identify major authors of British and American literature and describe distinctive features of their works.

Recognize the historical sequence of major literary figures, works, movements, and periods of world literature (including British and American) and relate them to their literary and cultural contexts.

This skill covers the major figures and concepts of literary history. The questions presume a level of knowledge generally achieved through a combination of high school English courses and a college-level

ENGLISH: Writing

survey of literature. Examples of British and American authors with whom undergraduates should be familiar include: Geoffrey Chaucer, William Shakespeare, Francis Bacon, John Milton, Jonathan Swift, William Wordsworth, Lord Byron, Samuel Taylor Coleridge, Percy Bysshe Shelley, Mary Wollstonecraft Shelley, Jane Austen, Charlotte Bronte, Emily Bronte, Charles Dickens, Thomas Hardy, Joseph Conrad, James Joyce, Virginia Woolf, Washington Irving, Edgar Allan Poe, Nathaniel Hawthorne, Ralph Waldo Emerson, Henry David Thoreau, Walt Whitman, Mark Twain, Emily Dickinson, Henry James, Stephen Crane, T.S. Eliot, William Faulkner, Robert Frost, Flannery O'Connor, Tennessee Williams, Richard Wright, Sylvia Plath, and Toni Morrison.

Examples of world authors may include but are not limited to: Homer, Confucius, Aristotle, Plato, Sophocles, Horace, Virgil, Augustine, Dante Alighieri, Miguel de Cervantes, Jean-Baptiste Molière, Jean-Jacques Rousseau, Johann von Goethe, Gustave Flaubert, Fyodor Dostoevsky, Henrik Ibsen, Marcel Proust, Thomas Mann, Franz Kafka, Bertolt Brecht, and Jorge Luis Borges. In addition, you should be familiar with major literary periods, such as Classical, Medieval, Renaissance, Neo-Classical, Romantic, Realistic, Naturalistic, Modern, and Contemporary.

Sample Question

Which literary movement most frequently produced works that “objectively” examined the psychology and conduct of middle-class society?

- A. Classical
- B. Medieval
- C. Romantic
- * D. Realistic

This question assesses your ability to identify a particular literary period, given a brief description of the subject matter and style generally associated with works of that period. Other questions assessing this skill may ask you to identify the author who wrote a particular title, or to identify a work based on information about its authorship, plot, theme, style, or characters. You might also be asked to identify the correct sequence of major literary figures, or to place a literary work into historical context.

Cluster: Writing

The writing cluster includes three skills. Two of these skills are assessed through multiple-choice questions covering the writing process and conventions of standard written English. The other skill is assessed through a written essay.

Skill 104

Understand the various elements of the writing process, including collecting information and formulating ideas, determining relationships, arranging sentences and paragraphs, establishing transitions, and revising what has been written.

Enabling Subskills

Identify and apply appropriate prewriting strategies, organizational methods, and research techniques.

Improve the clarity, coherence, organization, and style of a text through revision.

This skill involves the various stages of the writing process, from gathering and organizing information to revising the rough draft. Typical questions may require you to identify an appropriate strategy for prewriting or to analyze an outline for flaws in organization. You might also be asked to select the best source of information for a particular purpose or to revise an awkward sentence. The sample question below illustrates a type of question that might be used to assess the second enabling subskill (i.e., revision).

Sample Question

Which is the best revision of this sentence?

Bubonic plague has threatened the population of the whole, entire world for millennia.

- * A. Bubonic plague has threatened the world’s population for millennia.
- B. Bubonic plague has threatened the world for millennia.
- C. Bubonic plague has threatened worldwide population and the safety of the world for millennia.
- D. Bubonic plague has threatened the population and safety of the world for millennia.

Questions assessing skill 104 do not require you to correct errors in grammar, punctuation, capitalization, or spelling. (See skill 105.) Rather, you will be asked to identify the revision that improves the organization, clarity, or conciseness of the original sentence. Although the original sentence contains no errors, the wordiness reduces its effectiveness. For example, “whole” and “entire” mean nearly the same thing in the phrase “population of the whole, entire world.” Options C and D introduce further problems of wordiness. Option B, although shorter, leaves out important information from the original sentence. Thus, A is the correct answer to this question.

Skill 105

Use the conventions of standard written English.

Enabling Subskills

Identify the parts of speech and grammatical elements of a sentence.

Recognize and correct common flaws in diction, grammar, mechanics, and punctuation.

This skill involves the correction of nonstandard diction, grammar, mechanics, and punctuation. Although you will not be asked to define grammatical terms, you should be familiar with such terms as subject, verb, object, noun, pronoun, adjective, misplaced modifier, tense, agreement, and parallelism. Typical questions assessing this skill might present a sentence or a paragraph containing errors or examples of nonstandard English and direct you either to identify the flaws or to identify a corrected version. Other questions might ask you to identify the term that best describes a given error. The sample question below illustrates one type of question that could be used to assess the second enabling subskill.

Sample Question

What correction, if any, should be made in this sentence?

As an educator, good writing is important to me.

- * A. As an educator, I know that good writing is important.
- B. As an educator, the importance of good writing is obvious to me.
- C. As an educator, which I am, good writing is important.
- D. No correction is required.

This question assesses your ability to identify a correction of a common grammatical error. Of course, in order to identify the correction, you must first be able to identify the error. In this case, the original sentence contains a dangling modifier. In English, when modifiers occur at the beginning of a sentence, they usually describe the subject. “Writing” is the subject of the sentence, “As an educator, good writing is important to me.” Since the modifier, “As an educator,” does not describe the subject, “writing,” the modifier is said to be dangling. Option A, which introduces a person (“I”) into the subject position, corrects the problem.

Skill 106

Write an organized, coherent, and effective essay.

Enabling Subskills

Formulate a central idea suitable to the occasion for writing, focusing it as required by the work’s format and the expectations of the audience.

Select a rhetorical strategy and pattern of development that effectively organize ideas.

Develop ideas logically and coherently with adequate supporting detail.

Employ unified paragraphs, varied syntax, and precise diction to present ideas clearly and efficiently.

Create a voice and tone appropriate to the audience and purpose.

Observe the conventions of standard written English.

This is the only skill in *College BASE* that is not evaluated through multiple-choice questions. Instead, you will be asked to write an essay in response to a specific prompt. You will only be required to write one essay during any given administration of *College BASE*. There is no choice among prompts. *College BASE* essay prompts focus on issues and concerns common to college campuses rather than on course-specific knowledge or current events. The prompt will provide you with a specific situation and an equally specific audience to which you should direct your response.

In order to demonstrate mastery of this skill, you must analyze a specific situation and compose a thoughtful, well-supported essay directed to the particular audience specified in the prompt. You will have forty minutes in which to compose your essay. You are encouraged to use a portion of that time to make notes or to do any other prewriting activities that you find helpful. However, you should not plan to revise extensively or to recopy your essay.

ENGLISH: Writing

The sample writing prompt below is typical of the kind of question you may encounter in the essay portion of *College BASE*. Following the sample question, you will find a competently written student essay. With the exception of being typed, the essay is reproduced just as the student wrote it. Beginning on

page 11 you will find a description of the scoring procedure used to evaluate the *College BASE* writing exercise, detailed commentary on this particular essay, and the score it received. Reading the sample essay and the scoring criteria will help you appreciate what is expected of your own essay.

Sample Prompt

Imagine that you are attending a college that is contemplating a change in its curriculum. The current curriculum is called a “core curriculum.” All students who attend the school are required to take the same set of courses during the freshman and sophomore years. This requirement, supporters argue, assures that students have many experiences in common, and it gives them the information they need to select a major during their junior year. The proposed curriculum, called an “open curriculum,” would not go into effect for at least three years and thus would not affect you. It would, though, completely do away with requirements for all students entering after it is adopted. Supporters of the open curriculum argue that it will encourage students to make their own choices and thus better prepare them for life after college.

The College Policy Committee, composed of faculty members and administrators, has asked students to submit statements expressing their attitudes toward the current and proposed curricula, and you have decided to submit such a statement.

In an organized, coherent, and supported essay directed to the Committee, explain what you believe the Committee should do and why it should do so, as well as your general attitudes toward the priorities your school must set.

I realize that the decision about whether to retain the core curriculum or to adopt an open curriculum is very difficult. Nonetheless, I urge the Committee to adopt the open curriculum because this enables students to make their own choices as to what curriculum they want to follow.

Many Freshmen and Sophomores are undecided about what area to follow because they haven't experienced a varied high school curriculum. A big part of figuring out what interests one is by taking a lot of different courses which are varied. But some students have a general idea about their interests. Thus it would be a waste to take Art classes if one was interested in the sciences.

Generally every major requires classes that pertain to different subject matters. This will certainly guarantee the student a well rounded education. But with a declared major students are also able to concentrate on their area of interests. With the closed core system many students are stuck in classes with which they have no interest. But an open system would allow them to take their preferred classes along with the required classes.

Forcing students to stick to a closed core system may also be detrimental to the students study habits as well as grades. If students are forced to take classes they don't like then they are less likely to work for the top grade. When students are forced into a curriculum a negative feedback is likely to occur. But if students are able to chose their own set of classes then they obviously know what is required. When entering a class that's interesting to a student, he/she is much more likely to put time and energy into it.

A closed core curriculum also puts limits on the students variety of friends. If Freshmen and Sophomores are all thrown into the curriculum then obviously these will be the majority of the people they meet. It is important to become acquainted with students the same age, older, and younger. Older students have gone through a lot and have much good advice to offer younger students. It would be unfortunate to put limits on the age of ones friends.

I've argued strongly against the closed core curriculum mainly because I enjoy the freedom of choosing my own classes. I would strongly oppose being forced into certain classes with which I have no interest. True the closed curriculum exposes a student to a variety of subjects. But I feel that the requirements of one's major does a good enough job of giving a student a well rounded education.

Scoring Procedures

Your essay will be read by at least two professional evaluators familiar with college-level writing. *College BASE* essay readers are trained to evaluate your work as a whole. While the mechanics of composition (e.g., punctuation, spelling, grammar) certainly affect their

reading, they understand the time constraints you are under. They will score your essay based on its overall success in satisfying the demands of the question and in meeting the standards described below. Your essay is evaluated on the following 6-point scale, with 6 being the highest score possible.

Score Points

Score of 6: Essays assigned a “6” will be excellent in nearly all respects, although the circumstances under which the essays were written allow for some imperfections. The “6” essay should employ a sound organizational strategy with clearly developed paragraphs proceeding from a sharply focused and clearly identifiable main idea or thesis. Assertions should be sufficiently developed and directed to engage the specified audience and should be supported through appropriate examples, details, and/or other fully integrated rhetorical techniques (e.g., analogy, narration). Again, considering the writing situation, there should be few, if any, distracting grammatical and mechanical errors.

Score of 5: Essays assigned a “5” will be good, but not excellent, in almost all respects. Specifically, look for a thesis or main idea that is clearly discernible and for sophisticated reasoning and/or support, going well beyond the information provided by the prompt. The writer will engage the opposition, beyond a passing reference, and may even redefine the problem while not evading it. A “5” may be marred by some stylistic and/or organizational problems, or it may be well-organized and fairly sophisticated at the sentence level but fail to use or fully integrate a variety of rhetorical devices. There should be few distracting grammatical and mechanical errors.

Score of 4: Essays assigned a “4” will present a competent thesis and adequate organization and will acknowledge the opposition, even if that acknowledgment takes the form of an indictment. A “4” may rely heavily on the prompt for ideas but supply sophisticated examples, or it may present ideas beyond the prompt but offer scant or predictable support. An essay which shows some insights but fails to unite them may also receive a “4.” Generally, a “4” may contain a few distracting grammatical and mechanical errors, although essays appreciably damaged by major errors should not receive a “4.”

Score of 3: Essays assigned a “3” will contain some virtues, although they may contain an unengaging or poorly focused main idea or thesis or be marred by inadequate development. A “3” might, for example, express some ideas that reflect a thoughtful consideration of the problem, but at the same time be obscured by unclear or “incorrect” writing. On the other hand, it might represent clear and competent writing but convey superficial ideas, or ideas which fail to account for information provided in the prompt. A “3” may be primarily a list of responses to the prompt, but with some development of the listed ideas, or it may show an organizational strategy which goes beyond listing, but offers support only in list form. As an argumentative essay, it may exhibit specious or circular reasoning or lack the coherence necessary to foster a complete understanding of the writer’s meaning. A number of major and distracting grammatical and mechanical errors may place an otherwise thoughtful and well-written essay in this category.

Score of 2: Essays assigned a “2” are weak because they are poorly written throughout (with consistent errors in grammar or mechanics), or because they fail to support major points, or because they are exceedingly superficial. A “2” may be flawed by a lack of unity or discernible organizational pattern, or it may rely upon a clearly organized list with little or no development or simple development which presents personal examples as proof.

Score of 1: Essays assigned a “1” will be clearly unacceptable as college-level writing or will demonstrate an only momentary engagement with the topic, concentrating instead upon some tangential concern(s). A “1” will be riddled with major grammatical and mechanical errors and/or will consist of a collection of random thoughts or undeveloped ideas. In short, essays that appear to have been written in careless haste or without effort should receive a “1.”

Score of 0: Essays that for any reason cannot be read should be assigned this score.

MATHEMATICS: General Mathematics Proficiency

Discussion of Sample Essay

The preceding sample essay opens with a clearly stated thesis, and the writer acknowledges, although sparingly, that the opposing view has its merits. In addition, the writer provides basic support for the thesis with ideas and examples.

Some of the examples tend toward generalities rather than specifics, however, and their relevance is not always readily apparent. In fact, without a great deal of support, an overtly opinionated generalization—such as the statement that concludes the second paragraph—could easily alienate a reader. Many scientists deeply appreciate the arts, and members of the committee debating the curriculum probably include faculty from the arts and humanities—faculty who may be so put off by the comment as to dismiss the writer’s arguments altogether.

Nonetheless, the writer demonstrates basic competence in organization and development as well as grammar and mechanics. While the essay has a few errors in grammar and mechanics, none is so distracting or confusing as to prevent the reader from understanding the writer’s intended meaning. Taking all aspects of the discussion into consideration, readers determined that the essay should receive a score of “4,” in accordance with the scoring criteria.

Mathematics

College BASE divides mathematics into three clusters: general mathematics, algebra, and geometry. The general mathematics cluster assesses computational skills, knowledge of basic mathematical concepts and notational systems, and the ability to use techniques of statistical reasoning. The algebra cluster assesses ability to solve linear equations, inequalities, and quadratic equations and to reduce numerical expressions to their lowest terms. The geometry cluster assesses knowledge of basic geometrical concepts and ability to use those concepts in calculations. You are allowed to bring your own hand-held, non-printing calculator and to use it for any of the mathematics problems, but you may not share a calculator or use any instructional material. A *College BASE Study Guide for Mathematics* is now available (see Appendix D).

Cluster: General Mathematics Proficiency

The general mathematics cluster consists of three skills: practical applications, properties and notations, and using statistics.

Skill 201

Use mathematical techniques in the solution of real-life problems.

Enabling Subskills

Solve word problems requiring computation of base, rate, or percentage, including problems related to interest, discount, taxes, and paycheck deductions.

Solve word problems involving time, distance, and velocity.

Solve word problems involving ratio and proportion.

This skill involves the solution of realistic word problems. In order to demonstrate mastery of this skill, you must be able to screen out irrelevant data, apply correct formulas, and perform calculations or determine ratios. Formulas are not provided for problems assessing this skill. The sample question below illustrates one type of word problem that could be used to assess the second enabling subskill.

Sample Question

Susan left Georgetown for Mt. Vernon at 1:00 in the afternoon. She traveled at 50 miles per hour for the first 62.5 miles. She stopped for 20 minutes and then drove at 60 miles per hour for 150 miles. At what time in the afternoon did Susan arrive in Mt. Vernon?

- A. 2:32
 - B. 4:05
 - * C. 5:05
 - D. 5:35
-

This question asks you to solve the problem using the formula: $\text{time} = \text{distance} \div \text{rate}$. However, like other questions assessing this skill, this problem requires you to perform a number of steps in order to arrive at the correct solution. Susan’s trip involves three stages: the first 62.5 miles, traveled at 50 mph; the 20-minute stop; and the last 150 miles, traveled at 60 mph. To determine Susan’s arrival time, you must first calculate the time required for each part of Susan’s journey. Substituting the distance and the rate into the formula $t = d \div r$ reveals that one portion of the journey required 1 hour and 15 minutes ($62.50 \div 50$) and the other portion of the journey took 2 hours and 30 minutes ($150 \div 60$). After dividing the distance by the rate, you must convert the resulting decimal into hours and minutes (e.g., 1.25 hours equals 1:15). Finally, to determine Susan’s arrival time, you must add the times required for each stage of Susan’s trip (1:15 + 2:30 + :20) to her departure time of 1:00 P.M. The correct answer is 5:05 P.M.

Skill 202

Use the language, notation, and deductive nature of mathematics to express quantitative ideas with precision.

Enabling Subskills

Use and interpret such set concepts as union and intersection, and identify finite, infinite, and empty sets.

Convert a verbal description of a mathematical relationship to a symbolic mathematical statement.

Identify integers, real numbers, rational numbers, and irrational numbers.

Identify applications of the identity, inverse, associative, commutative, distributive, and transitive properties of real numbers.

Identify patterns in numerical progressions and predict further sequential elements.

This skill covers the basic concepts and vocabulary of mathematics. In order to demonstrate mastery of this skill, you must be able to identify and define mathematical terms and to apply fundamental concepts. Typical questions assessing this skill may require you to identify unions and intersections of sets, select a specified set, translate verbal descriptions into mathematical symbols, identify valid mathematical statements, or predict elements in a sequence. Some questions will be expressed using appropriate mathematical symbols, while others will rely on verbal descriptions of mathematical concepts. The sample question below illustrates a type of question that may be used to assess the first enabling subskill.

Sample Question

Which set is infinite?

- * A. the set of all integers
- B. the set of positive whole numbers less than 10
- C. {0}
- D. {2, 4, 6, 8}

This question requires you to select which of the four options represents an infinite set. In order to correctly answer this question, you must first recall and comprehend the definition of an infinite set. Next, you must analyze the four options to determine which set fits that definition. The correct answer is A.

Skill 203

Use the techniques of statistical reasoning and recognize common misuses of statistics.

Enabling Subskills

Calculate and interpret probability, including that of independent and mutually exclusive events.

Recognize inappropriate statistical reasoning and incorrect or misleading displays of statistical data.

Calculate and interpret mean, median, mode, and range.

This skill covers fundamental statistical concepts and terminology, and common applications of statistical reasoning in daily life. Typical questions assessing this skill may direct you to compute probability; identify accurate interpretations of statistical information; recognize flaws in statistical reasoning; or calculate the mean, median, mode, or range of a specified set of values. The sample question below illustrates one type of question that could be used to assess the first enabling subskill (i.e., probability).

Sample Question

The probability of having a male child is 50 percent. A couple now has two children, both of whom are male. What is the probability that the couple's third child will be male?

- A. 0.125
- * B. 0.50
- C. 1.00
- D. 1.25

This question assesses your understanding of fundamentals of probability theory. The question focuses on determining the likelihood that a specified event will occur and the dependence or independence of probability on other events or circumstances. In the situation described above, each time a couple has a child, the probability of its being male is 50 percent (0.50), regardless of the number of children the couple has. Thus, the correct answer is B.

MATHEMATICS: Algebra

Cluster: Algebra

The algebra cluster consists of two skills: evaluating expressions, and equations and inequalities.

Skill 204

Evaluate algebraic and numerical expressions.

Enabling Subskills

Simplify algebraic expressions by substituting given values.

Simplify numerical and algebraic expressions, using the hierarchy of operations and grouping symbols.

This skill encompasses the fundamentals of algebraic and numerical expressions. In order to demonstrate mastery of this skill, you must be able to identify numerical equivalents of algebraic expressions and to reduce numerical expressions to their simplest terms. You should be familiar with symbols used in this branch of mathematics as well as with conventions governing the manipulation of signs and the hierarchy of operations. The sample question below illustrates a type of question that may be used to assess the second enabling subskill.

Sample Question

Simplify:

$$3 - [4 - (3^2 - 2 \cdot 5)]$$

- A. 0
 - * B. -2
 - C. 18
 - D. 34
-

This question assesses your ability to simplify a numerical expression. In order to arrive at the correct answer, you must perform the operations in the proper order and follow rules governing the manipulation of positive and negative signs. In order to reduce the above numerical expression, you should begin with the operations within the parentheses. First, determine the square of 3; then multiply 2 times 5. The expression at this point will be: $3 - [4 - (9 - 10)]$. Continuing with the expression within the parentheses, subtract 10 from 9. The expression has now been reduced to $3 - [4 - (-1)]$. The next step is to subtract -1 from 4, resulting in 5. Finally, subtract 5 from 3, and the expression has been reduced to -2.

Skill 205

Solve equations and inequalities.

Enabling Subskills

Solve linear equations.

Solve linear inequalities.

Use the quadratic formula to solve quadratic equations.

This skill covers linear equations and linear inequalities that have one variable. In order to demonstrate mastery of this skill, you must be able to solve linear equations and inequalities involving at least two operations. Questions for this skill may require you to apply the quadratic formula to identify possible values of the variable in a quadratic equation. The sample question below illustrates a type of question that may be used to assess the second enabling subskill (i.e., linear inequalities).

Sample Question

Solve for x :

$$2x - 8 \geq 5x - 2$$

- * A. $x \leq -2$
 - B. $x \geq -2$
 - C. $x \geq 2$
 - D. $x \geq \frac{10}{7}$
-

This question assesses your ability to solve linear inequalities that have one variable. In order to solve the above inequality, begin by adding 8 to each side of the inequality sign ($2x \geq 5x + 6$). Next, subtract $5x$ from each side ($-3x \geq 6$). Finally, divide each side by -3 , remembering that when you divide by a negative number when dealing with inequalities, you must reverse the inequality sign. The correct answer to the above question is A, $x \leq -2$.

Cluster: Geometry

The geometry cluster consists of two skills, knowledge of two- and three-dimensional figures, and geometrical calculations.

Skill 206

Recognize two- and three-dimensional figures and their properties.

Enabling Subskills

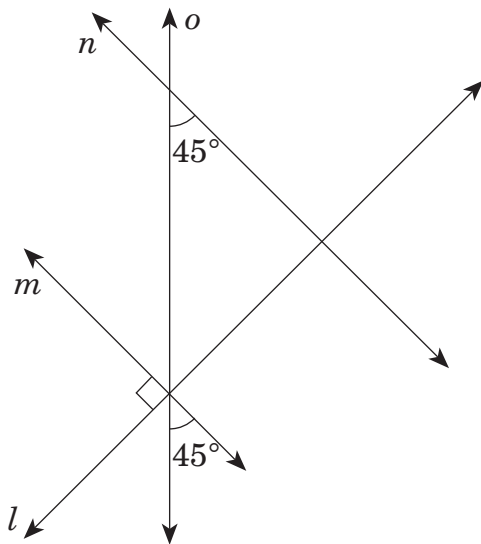
Identify parallel, perpendicular, and intersecting lines and determine the angle relationships they create by recognizing acute, obtuse, vertical, right, adjacent, supplementary, and complementary angles.

Identify two- and three-dimensional geometrical figures.

Identify similar and congruent polygons.

This skill involves understanding the basic terminology, concepts, and symbols of geometry. To demonstrate mastery of this skill, you must identify the relationships among lines and angles depicted on diagrams, provide the names for diagrams of basic two- and three-dimensional figures, and recognize similar and congruent figures. The sample question below illustrates one type of question that may be used to assess the first enabling subskill.

Sample Question



Which lines are perpendicular?

- * A. l and n
- B. l and o
- C. m and n
- D. m and o

This question assesses your ability to identify which of several lines depicted in a diagram are perpendicular. Diagrams often will include angle measures or relationships that provide evidence of the relationship among the lines. Questions themselves may occasionally use symbols for relationships such as parallel and perpendicular lines and right angles. Often, however, you will need to go beyond information presented in the diagram and apply basic theorems of geometry. For example, to determine whether the intersection of lines l and n forms a right angle, you must use knowledge of vertical and supplementary angles.

Skill 207

Use the properties of two- and three-dimensional figures to perform geometrical calculations.

Enabling Subskills

Calculate the perimeter and area of two-dimensional geometrical figures.

Calculate the area and volume of three-dimensional geometrical figures.

Use the Pythagorean Theorem to solve problems involving right triangles.

This skill covers calculations and practical applications of geometry. Questions assessing this skill present situations that require you to exercise knowledge of geometry in the solution of everyday problems. You will also confront straightforward problems which require you to compute the perimeter, area, or volume of a variety of geometrical figures. Formulas will be provided for all three-dimensional figures except rectangular solids. Formulas will not be provided for two-dimensional figures. The sample question below illustrates one type of question that may be used to assess the second enabling subskill.

Sample Question

What is the surface area in square centimeters of a cube with edges measuring 3 centimeters?

- A. 9
- B. 27
- C. 36
- * D. 54