Praxis® Core Ultimate Guide

Preparing to take the Praxis® Core?

Awesome!

We will answer every question you have and tell you exactly what you need to study to pass the Praxis® Core.

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Quick Facts

Overview:

The Praxis® Core Academic Skills for Educators exam tests individuals in reading, writing, and mathematics. Its purpose is to measure the skills and content knowledge of individuals entering into teacher preparation programs.

Format:

Test	Number of Questions	Time Limit
Reading	56 selected-response	85 minutes
Mathematics	56 selected-response	90 minutes
Writing	40 selected-response 2 essays	40 minutes 30 minutes per essay

Be mindful of newly updated test numbers. Listed below are the changes for the current exam:

- Reading 5713 (new) same as 5712 (old)
- Mathematics 5733 (new) same as 5732 (old): the content categories have changed for the new mathematics exam
- Writing 5723 (new) same as 5722 (old)
- Combined test 5752 (new) same as 5751 (old)

It is important to note that while the test codes changed for the Reading and Writing test, the content categories and skill specifications remained unchanged; however, the new Mathematics test has different content categories and adjusted skill specifications.

Cost:

$90 for each subtest or
$150 for the combined exam

Scoring:

The score range is 100-200. The passing rate varies per state but generally, you need a 156 on the reading exam, 150 on the mathematics exam, and a 162 on the writing exam.

Quick Facts

Pass rate:

46% pass rate across all subtests

Study time:

It is important to set goals to know how much time you need to devote to studying each day. Start off assessing how well you know the content by taking a practice sample test. Use the information you are not familiar with to create a study plan. Stick to your developed plan and make sure to cover all material thoroughly. Take the practice sample test again to gauge if you're ready to take the real exam.

What test takers wish they'd known:

- What the test covers
- How to use the computer-based calculator
- To arrive early to have adequate time for the tutorials on how to take the test
- To check test numbers to ensure registering for the correct test
- That test numbers have changed recently
- How important practice sample tests are

Information obtained from the ETS website.

Did you know?

240 offers FREE practice tests to help you identify your strongest and weakest areas!

Reading:

Overview

The Core Reading test (5713) has 56 selected-response questions. You will have 85 minutes to complete this test.

There are three content categories on the Core Reading test:

Content Category	# of Questions	% of Test
Key Ideas and Details	17-22	35%
Craft, Structure, and Language Skills	14-19	30%
Integration of Knowledge and Ideas	17-22	35%

Let's explore a few of the specific concepts that are highly likely to appear on the exam.

Main Idea and Primary Purpose

The main idea is what the text is mostly about. The main idea may be clearly stated in a topic sentence, or a reader may need to read the text in detail and decide what it is mostly about. The primary purpose is the reason the author wrote the text. It could be to persuade a reader, to inform a reader, or simply to entertain a reader. The main difference between the two is that the primary purpose focuses on the author's intention and the main idea focuses on the content of the text. So how do you find the main idea of a passage? The primary purpose? Let's use the following passage to explain how to find the main idea and primary purpose:

*When you come suddenly upon the **porcupine in his native haunts**, he draws **his head** back and down, puts up **his shield**, trails his broad tail, and waddles slowly away. **His shield** is the sheaf of larger **quills** upon his back, which he opens and spreads out in a circular form so that the whole body is quite hidden beneath it. The porcupine's great chisel-like teeth, which are quite as formidable as those of the woodchuck, he does not appear to use at all in his defense but relies entirely upon his **quills**, and when those fail him he is done for.*

Throughout the passage, details on how a porcupine defends himself are bolded. These details support the conclusion that the main idea = the defense mechanisms of the porcupine.

Then ask yourself, Why is the author writing this? The primary purpose = to describe and educate the reader about the defense mechanisms of the porcupine.

Draw Inferences

Inference is using your background knowledge and what you read in a text to make a logical assumption. Finding the main idea of a passage first will be helpful because any inference you make shouldn't contradict it; make sure you can defend the inference using facts or statements from the passage. So how do you draw an inference from a text? Let's take a look at the passage below to answer the inferencing question:

*It has been seen that flames have been prominent sources of artificial light; and although of low luminous efficiency, they still have much to commend them from the standpoints of portability, convenience, and subdivisions. The materials which have been burned for light, whether solid or liquid, are **rich in carbon** and the solid particles of carbon by virtue of their incandescence are **responsible for the brightness of a flame.***

According to the information provided in the passage, which of the following inferences can be made?

A. Artificial light is most effective with minimal carbon.
B. The more carbon, the hotter the flame.
C. Artificial light is brightest when it burns the hottest.
D. The more carbon, the brighter the light.

D is the correct answer because the boldface words in the passage help to support the fact that materials rich in carbon create the brightness of the flame.

Analyze Organization

You will be asked to identify how an author constructed a passage or how paragraphs are related to one another. Here are some examples of how text can be organized:

- **Sequential order** puts events or ideas in order based on logic.
- **Chronological order** puts events in order based on time.
- **Order of importance** puts events or steps in order based on their importance. They can be ordered from least important to most important or vice versa.
- **Spatial order** puts objects in order based on physical or directional location.
- **Cause and effect** explains the reasons something happens and the results of it happening.
- **Problem and solution** states how a problem or conflict is resolved.
- **Compare and contrast** lists and explains the similarities and differences between two or more things.

Fact vs. Opinion

The same piece of writing can include both facts and opinions. Often in an argumentative or persuasive piece, the author will use facts and details to prove his opinion is correct. Remember that facts are details that can be proven. Opinions are more emotional statements that represent the author's beliefs about the topic. Here are some examples:

Fact: The atmosphere is about 78% nitrogen gas.
Opinion: Van Gogh is by far the greatest painter of his time.

Interpret Graphs

Graphs are often included in informational texts to supplement the main idea or provide a visual depiction of the data provided. Some features to look for in a graph are headings, captions, a key, a scale, and labels. The reader should read all text presented with the graph, determine the type of graph used, and identify what relationship the data is showing. Using the graph below, let's look at some of these features to analyze the type of graph and its data.
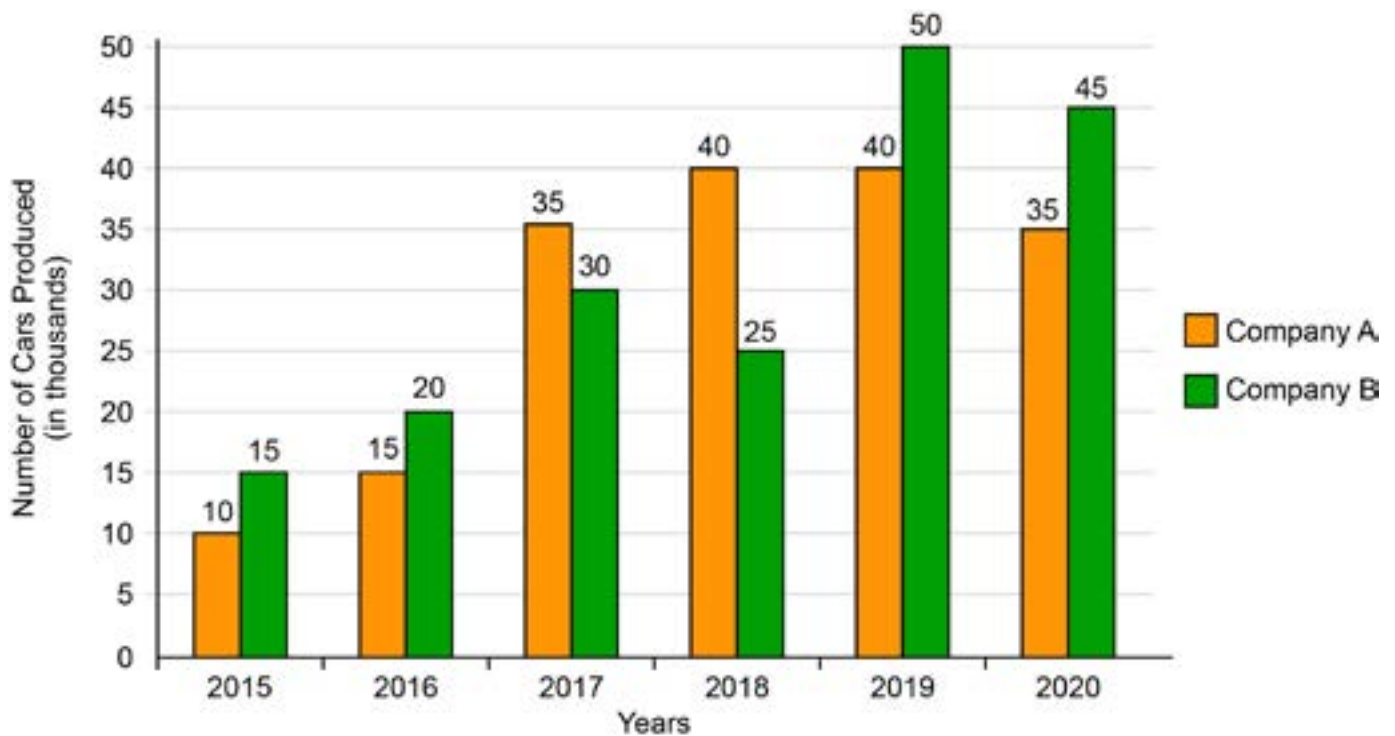
The graph shown is a bar graph that has a **key** to show the color-coding of each company: Company A is orange and Company B is green. The graph also shows bar **labels**, indicating the years from 2015 to 2020.

The horizontal axis **title** is Years, referring to the bar labels listed. The vertical axis has a **title** of Number of Cans Produced (in thousands). The vertical axis also has a **numbered scale** that correlates to the vertical axis title indicating how many cans were produced by each company each year.

Meaning of Words

You will be asked to identify the meaning of a given word based on how it is used in a passage. When figuring out the meaning of words, there are some strategies to help narrow down the answer choices.

- Context clues are hints that the author gives within the text. They can be in the same sentence as the unfamiliar word or in the surrounding sentences.
- Syntactic clues help a reader figure out an unfamiliar word through the structure of the sentence in which the word appears.
- Replace the answer choices in the passage to see if it makes sense.

Let's look at the example problem below and use the strategies suggested.

A picture is worth a thousand words. When you go on vacation, it is often customary to send friends and family members photo postcards from the beautiful places you visit. The postcards not only let them know where you are and how you're doing, but they provide them with a keepsake from your vacation. Today, the ritual of sending postcards has been somewhat replaced by posting vacation pictures on Facebook, Instagram, and other social media sites. In a recent survey of vacationers, 75% said that they are more likely to post on Facebook than to send a postcard. Not long ago, however, it was not uncommon for people to amass many hundreds of postcards **received** from acquaintances. **As these collections grew**, a hunger for more postcards arose, and some people became amateur postcard collectors.

The author probably uses the word "amass" to mean:

    A. achieve.
    B. surrender.
    C. purchase.
    D. gradually gather.

D is the correct answer. The boldface words in the passage are context clues that help to clarify the meaning of the word amass. **Grew** means that they started out small and got bigger, and **collection** indicates many. Both of these words help the reader to understand that amass means to gradually gather.

You also could replace amass with the various answer choices to see which one makes sense semantically or syntactically.

And that's just some very basic information about the Core Reading test.

Now, let's look at a few practice questions.

Did you know?

240 Study Guides have hundreds
of practice questions.

Question 1

Consider the following passage:

Most reading will be for the content. It is desirable that the reading be easy and rapid, and that one gathers in all the ideas as one reads. Because of the fact that oral reading is slower, more laborious for both reader and listener, and because of the present easy accessibility of printed matter, oral reading is becoming of steadily diminishing importance to adults. No longer should the central educational purpose be the development of expressive oral reading. It should be rapid and effective silent reading for the sake of the thought read.

Which of the following statements about expressive oral reading can best be inferred by this passage?

    A. Oral reading allows for a wider sharing of ideas.
    B. Oral reading was an educational mainstay in the past.
    C. Expressive oral reading is educationally effective.
    D. Oral reading is faster than silent reading.

Correct Answer: B. The passage states that the central educational purpose should "no longer" be oral reading, inferring that it used to be a mainstay.

Question 2

Consider the following passage:

In all probability no student of mycology has any one query more frequently or persistently pressed upon his attention than the question, "How do you tell a toadstool from a mushroom?"—or if in the woods or fields, in search for new species, with an uninitiated comrade, he has frequently to decide whether a certain specimen "is a mushroom or a toadstool," so firmly fixed is the idea that one class of fungi—the toadstools—are poisonous, and the other—the mushrooms—are edible and altogether desirable; and these inquiring minds frequently seem really disappointed at being told that they are one and the same thing; that there are edible toadstools and mushrooms, and poisonous mushrooms and toadstools; that in short a toadstool is really a mushroom and a mushroom is only a toadstool after all.

This passage is primarily concerned with:

    A. dispersing false ideas about mushrooms and toadstools being separate groups.
    B. the different levels of toxicity of mushrooms and toadstools.

C. how to tell toadstools and mushrooms apart.
D. why mushrooms are fine to eat but toadstools are not.

Correct Answer: A. The primary purpose of this passage is to relate that the two designations are actually one group.

Question 3

Consider the following passage:

The light of the Crescent Moon, like some fairy boat suspended in the sky, is bright enough to cast changing and dancing sparkles of silver upon the ocean. The Evening Star declines slowly in its turn toward the western horizon. Our gaze is held by a shining world that dominates the whole of the occidental heavens. This is the "Shepherd's Star," Venus of rays translucent.

Which of the following best describes the way in which the information in this passage is conveyed?

A. A bizarre image is used to illustrate a ridiculous claim.
B. A metaphor and highly sensory language is used to convey awe for the night sky.
C. A generalization is made, followed by specific examples.
D. Examples of past experiences are used to define and illustrate the study of stars.

Correct Answer: B. This is the way the author is conveying the information.

Question 4

Consider the following passage:

Nature has so strongly marked the wild and the tame hog with the same characters, that no hesitation arises in pronouncing the former to be the stock from whence we have derived the latter. In common, however, with all other free and domesticated animals, there is a prolongation of muzzle in the wild species, which is not to be found in those of our sties.

Which of the following inferences about the hog can be made based on this passage?

A. Wild hogs and tame hogs look very similar to one another.
B. Wild hogs have a longer muzzle as they need to smell out their food.
C. Wild hogs are more aggressive than domesticated ones.
D. Domesticated hogs are easy to tell apart from wild ones.

Correct Answer: A. The passage supports this inference by stating that wild and domestic hogs have "the same characters."

Use the following passage to answer questions 5-7:

The Black Death, or, as it has been known, the Oriental plague, the bubonic plague, or in England, simply the plague, and in Italy, "la Mortalega" (the great mortality) derived its name from the Orient; its inflammatory boils, tumors of the glands, and black spots, indicative of putrid decomposition, were such as have been seen in no other febrile disease. All the symptoms were not found in every case, and in many cases one symptom alone preceded death. Although afflicted with all the manifestations of the plague, some patients recovered.

According to Hecker the symptoms of cephalic affliction were seen; many patients were stupefied and fell into a deep sleep, or became speechless from palsy of the tongue, while others remained sleepless and without rest. The fauces and tongue were black and as if suffused with blood; no beverage could assuage the burning thirst, so that suffering continued without alleviation until death, which many in their despair accelerated with their own hands. Contagion was evident, for attendants caught the disease from their parents and friends, and many houses were emptied of their inhabitants.

Question 5

This passage is primarily concerned with:

     A. the plague's many symptoms and its effects on individuals.
     B. the effects of religion on those who chose suicide over suffering.
     C. the widespread contamination by those treating the disease.
     D. the false assumptions about the disease that lead to hysteria.

Correct Answer: A. This is the main idea of the passage.

Question 6

The author mentions "death, which many in their despair accelerated with their own hands" to show:

     A. the loss of faith in the victims.
     B. the dissemination of false beliefs.
     C. the desperation of those suffering.
     D. the strict religious expectations.

Correct Answer: C. The author mentions this in order to show how desperate victims were to alleviate their pain.

Question 7

The passage suggests that the Black Death was hard to detect because:

    A. not all patients exhibited all or similar symptoms.
    B. it was highly contagious and proved fatal almost from the onset.
    C. there were no more people to treat patients and detect symptoms.
    D. people were too scared to be around plague patients.

Correct Answer: A. The passage explains the difficulties in diagnosis because "all of the symptoms were not found in every case."

Question 8

Consider the following passage:

The hopeless pessimism of the past, that saw in the unmerciful progress of organic evolution no escape for the human animal from the grip of fate, is about to give way to the enthusiasm of conscious directing and controlling power. This is the beneficial result of the age of the machine. Man has discovered that he can not only change his environment, but that by this change he can modify himself. The hope of the future lies in the moulding of man's surroundings to his needs.

The evidence the author presents in this passage supports which of the following conclusions?

    A. Humankind was happier before the age of machines.
    B. Humankind created machines to change the environment.
    C. It is most natural for humans to live in harmony with nature.
    D. Humankind should accept its fate as a creator of machines.

Correct Answer: B. The passage presents the ability to change one's environment as positive by using phrases like "beneficial result" and "hope of the future."

Question 9

Consider the following passage:

Pathological lying is falsification entirely disproportionate to any discernible end in view, engaged in by a person who, at the time of observation, cannot definitely be declared insane, feebleminded, or epileptic. Such lying rarely, if ever, centers about a single event; although exhibited in very occasional cases for a short time, it manifests itself most frequently by far over a period of years, or even a life-time. It represents a trait rather than an episode. Extensive, very complicated fabrications may be evolved. This has led to the synonyms:—mythomania; pseudologia phantastica.

Which of the following best describes the organization of this passage?

A. a rebuttal of a claim about the pathology of lying
B. a summary of recent progress in studying pathological liars
C. a refutation of former definitions of pathological lying
D. an in-depth definition of pathological lying

Correct Answer: D. This passage is organized as an in-depth definition of pathological lying.

Question 10

Consider the following passage:

It has been seen that flames have been prominent sources of artificial light; and although of low luminous efficiency, they still have much to commend them from the standpoints of portability, convenience, and subdivisions. The materials which have been burned for light, whether solid or liquid, are rich in carbon, and the solid particles of carbon by virtue of their incandescence are responsible for the brightness of a flame.

According to the information provided in the passage, which of the following inferences can be made?

A. Artificial light is brightest when it burns the hottest.
B. The more carbon, the brighter the light.
C. The more carbon, the hotter the flame.
D. Artificial light is most effective with minimal carbon.

Correct Answer: B. The passage explains that "solid particles of carbon...are responsible for the brightness of a flame."

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money-back guarentee if
you don't pass your exam!

Writing:

Overview

The Core Writing test (5723) has 40 selected-response questions and two essays. You will have 100 minutes to complete this test (40 minutes on selected-response questions and 30 minutes on each essay).

There are two content categories on the Core Writing test:

Content Category	Number of Selected-Response Questions	Number of Essays	% of Test
Text Types, Purposes, and Production	6-12	2	60%
Language and Research Skills for Writing	28-34	0	40%

Let's explore a few of the specific concepts that are highly likely to appear on the exam.

Pronoun-Antecedent Agreement

Pronouns need to match their antecedent (noun) in person, number, and gender.

Let's look at some example sentences and how to fix them.

*Susan called her husband to remind **her** to pick up bread, eggs, and milk.*
In this sentence the pronoun *her* does not match its antecedent *her husband*. The pronoun *him* should have been used instead.

Let's look at another example to fix.

*The teacher wanted the boy to bring **their** book to class.*
Their is the incorrect pronoun because it refers to more than one noun. "The boy" refers to only one noun. The pronoun *he* should have been used instead of *their*.

Misplaced and Dangling Modifiers

A modifier is a word or phrase that adds specific information about another word or phrase. A misplaced modifier is located away from the word it is supposed to be modifying, making the sentence confusing. A dangling modifier means that the subject being modified is missing from the sentence.

Let's look at some examples:

Incorrect: Paul was exhausted after mowing, and he fell right onto the bed **covered in sweat.**
Correct: Paul was exhausted and **covered in sweat** after mowing, and he fell right onto the bed.

The first example is incorrect and confusing because it places the modifier *covered in sweat* after *bed* instead of after *Paul*, the subject it is modifying.

Incorrect: Having broken his right hand, it was difficult to write.
Correct: Having broken his right hand, **Paul** had difficulty writing.

The first example is incorrect because it is missing the subject it is modifying, *Paul*. Changing *it* and rewording the clause helps make the sentence clear about who the *his* was referring to in the first clause.

Parallelism

Parallelism, also called parallel structure, is when a series of components in a sentence are written in a similar manner. The repetition creates balance and rhythm in the text.

He came, *he* saw, *he* conquered.

Like father, *like* son.

Sophia's favorite activities include running, biking, and skiing.

Credible Sources

Credible sources are those that readers can trust. What are some things to look for when deciding if a source is credible?

- Check for the source of information.
- Check for the URL extension. A URL extension is the notation at the end of a web address that categorizes the website type. The most credible online sources often end in ".edu" (educational institution) or ".gov" (government resource), but not always. Other URL extensions like ".com", ".org" and ".net" can be purchased by anyone.
- Evaluate the credibility of the author. Check to see if any other accredited sources have fact-checked the information, and find out whether the author is affiliated with any groups

that might suggest bias or hidden agenda.
- Check to see when the information was published. New research can quickly make the information outdated.
- Professional website design shows the source has spent money or time in their marketing and can show that a source is or isn't credible just by appearance.
- Check for citations and verify that any cited source information is correct.

Essay Tips

You will be required to write two essays for part of the writing exam. One essay will be an argumentative essay and the other one will be source-based. The selected-response questions and the two essays will be scored together for a total score.

Tips for organizing these essays:

1. Write a thesis statement. It is important to have a clear thesis in order to get full credit for the essays. Make sure to clearly state your point when writing the argumentative essay and insightfully explain why the topic is important on the source-based essay.
2. Create an outline of the body paragraphs. This will help you to structure your essays so you are able to express your ideas clearly.
3. Fill in paragraphs with details to support your opinions and facts.
4. Write a closing paragraph to wrap up your essay and emphasize your final thoughts.
5. Read carefully through the essay, checking the grammar, punctuation, and mechanics of your sentences. Check for subject-verb agreement throughout the essay and make sure the tone of your essay is appropriate for the style of writing.
6. Reread if time allows to make sure your sentences follow a rhythm and flow.

And that's just some very basic information about the Core Writing test.

Now, let's look at a few practice questions.

Writing Practice Questions

Question 1

Which answer correctly addresses the underlined portion of the sentence?

We love everything about our new house aside from the fact that one of <u>the neighbors have</u> a dog that is constantly barking.

    A. the neighbors have (no change needed)
    B. the neighbor's have
    C. the neighbors has
    D. the neighbors' have
    E. the neighbor's has

Correct Answer: C. This correctly changes the conjugation of the verb *have*. *Neighbors* is plural, but we are referring to "one of our neighbors," which is a singular subject, so we must use the singular verb form, "has."

Question 2

Identify the error in the sentence below.

<u>I purchased</u> a new bed for my dog, Peaches, but <u>she chewed it up</u> almost immediately, which <u>leads me to believe</u> that <u>she would prefer</u> to sleep on the couch. <u>No error.</u>

    A. I purchased
    B. she chewed it up
    C. leads me to believe
    D. she would prefer
    E. No error.

Correct Answer: E. Although there are multiple subjects and verbs in this sentence, there are no errors.

Question 3

Identify the error in the sentence below.

After a grueling soccer practice in the excessively hot sun, I was hungry and thirsty my mom took me home for dinner. No error.

A. grueling soccer practice
B. excessively hot
C. sun, I
D. thirsty my
E. No error.

Correct Answer: D. This is a run-on sentence, and the two independent clauses should be separated by a period, a semicolon, or a coordinating conjunction between "thirsty" and "my" (which should now be capitalized).

Question 4

Identify the error in the sentence below.

Josh and Nick couldn't <u>hardly</u> wait for the bell to ring on <u>Friday so </u>they could go home and play <u>their</u> new video game. <u>No error.</u>

A. hardly
B. Friday
C. so
D. their
E. No error.

Correct Answer: A. This double negative is incorrect. Either the word "hardly" should be deleted or "couldn't" should be changed to "could."

Question 5

Which answer correctly addresses the underlined portion of the sentence?

When deciding a vacation spot, the Johnson family considered cost, weather, and <u>how close it was to a beach.</u>

A. how close it was to a beach (no change needed)
B. how close to a beach
C. where a beach was
D. proximity to a beach

Correct Answer: D. This correctly changes the second part of the sentence so that the noun phrase "proximity to a beach" completes the list. This ensures that the sentence is parallel.

Question 6

Which of the following is a primary source for a research project on Jane Goodall?

    A. *My Life with Chimpanzees* by Jane Goodall
    B. a news article written based on an interview with Goodall
    C. a biography of Goodall provided on the Jane Goodall Institute website
    D. a documentary providing a broad overview of her life

Correct Answer: A. Since this is Jane Goodall writing about her own experience, it would be a primary source.

Question 7

United States Holocaust Memorial Museum. "Introduction to the Holocaust." *Holocaust Encyclopedia.* https://encyclopedia.ushmm.org/content/en/article/introduction-to-the-holocaust. Accessed on 4 Apr. 2019.

In the citation above, the inclusion of "United States Holocaust Memorial Museum" as the first item listed tells us that:

    A. this is the name of the website.
    B. this is a primary source with an unknown author.
    C. the individual name of an author was not provided.
    D. this is the title of the source and indicates that "Introduction to the Holocaust" is the subtitle of the article.

Correct Answer: C. When an individual author is not known, the organization publishing the material can be used instead for citation purposes.

Use the following passage to answer questions 8-10.

The excerpt below is from a 1918 cookbook encouraging Americans to conserve wheat.

(1) A slice of bread seems like an unimportant thing. (2) One good-sized slice of bread weighs an ounce. (3) It contains almost three-fourths of an ounce of flour. (4) If every one of the country's 20,000,000 homes wastes on the average only one such slice of bread a day, the country is throwing away daily over 14,000,000 ounces of flour—over 875,000 pounds. (5) That amount is enough flour for over a million one-pound loaves a day. (6) For a full year at this rate there would be a waste of over 319,000,000 pounds of flour—1,500,000 barrels—enough flour to make 365,000,000 loaves.

(7) As it takes four and one-half bushels of wheat to make a barrel of ordinary flour, this waste would represent the flour from over 7,000,000 bushels of wheat. (8) Fourteen and nine-tenths bushels of wheat on the average are raised per acre. (9) It would take the product of some 470,000 acres just to

provide a single slice of bread to be wasted daily in every home.

(10) Some say, "a full slice of bread is not wasted in every home." (11) Very well, make it a daily slice for every four or every ten or every thirty homes—make it a weekly or monthly slice in every home—or make the wasted slice thinner. (12) The waste of flour involved was still appalling. (13) Small changes made on a large scale would have made an impact on the amount of wheat used in this country. (14) These are figures compiled by government experts, and they should give pause to every housekeeper who permits a slice of bread to be wasted in her home.

Question 8

Which of the following best improves the underlined portion of sentences 2 and 3?

One good-sized slice of bread weighs <u>an ounce. It contains</u> almost three-fourths of an ounce of flour.

    A. an ounce; it contains
    B. an ounce; the bread contains
    C. an ounce, but it contains
    D. an ounce because it contains

Correct Answer: A. Of the available options, this would be the most logical choice because the semicolon connects the two related sentences.

Question 9

Where would the following sentence best be inserted?

But some suggest that this is an exaggeration.

    A. following sentence 9, at the end of the paragraph
    B. following sentence 5
    C. before sentence 10, at the beginning of the paragraph
    D. following sentence 10

Correct Answer: C. This would be the best location to include this sentence. It would serve as a transition into the main idea of the paragraph, since the paragraph goes on to refute this idea.

Question 10

What is the best way to deal with sentence 14?

These are figures compiled by government experts, and they should give pause to every housekeeper who permits a slice of bread to be wasted in her home.

    A. move it to the end of paragraph 1
    B. remove the sentence completely
    C. move it to the beginning of the passage
    D. leave it as is

Correct Answer: D. This sentence works well at the end of this passage to wrap up and provide context for the previous facts and information.

Need to brush up on your skills?

240 Study Guides walk you through everything you need to pass!

Mathematics:

Overview

The Core Mathematics test (5733) has 56 selected-response and numeric entry questions. You will have 90 minutes to complete this test. An on-screen calculator will be provided for you.

There are three content categories on the Core Mathematics test:

Content Category	# of Questions	% of Test
Number and Quantity	20	36%
Data Interpretation and Representation, Statistics, and Probability	18	32%
Algebra and Geometry	18	32%

Let's explore a few of the specific concepts that are highly likely to appear on the exam.

Scale Factor

Scale factors are used to help create models and drawings of extremely large or small items. The steps to using a scale factor:

1. Convert the measurements to decimals or to the same units
2. Set up a ratio using scale factor
3. Cross multiply and simplify
4. Divide both sides to isolate x

Example: A woman is 5 feet 4 inches tall and her shadow is 4 feet 2 inches long. A girl is standing next to her who has a shadow of 3 feet 3 inches long. How tall is the girl?

First, convert the height and shadows to inches. Then set up a ratio of height to shadow for each person:

Woman: $\dfrac{\text{Height}}{\text{Shadow}} = \dfrac{64 \text{ in}}{50 \text{ in}}$

Girl: $\dfrac{\text{Height}}{\text{Shadow}} = \dfrac{x}{39 \text{ in}}$

Now, combine the two ratios into a proportion:

$\dfrac{64}{50} = \dfrac{x}{39}$

Cross-multiply:

64(39) = 50x
2496 = 50x

Divide both sides by 50 to isolate x:

x = 49.92 inches

So the girl's height is about 4 feet and 1.92 inches

Percent Change

The percent change is the amount of increase or decrease between two numbers, compared to the original number, written as a percent.

percent change = 100% x change divided by original

To find percent change:

     Find the difference or the change in the two values being compared
     Divide the value of the change by the original number
     Multiply by 100

Gabrielle is a babysitter who charges an hourly rate for her services. She has recently increased her rate from $12.50 an hour to $15.00 an hour. What percent change is represented in her fee increase?

First, subtract: 15 - 12.50 = 2.50
Second, divide: 2.50 / 12.50 = .2
Last, multiply the result by 100 to find the percentage: .2 x 100 = 20%

Fractions, Decimals, and Percents - Conversions
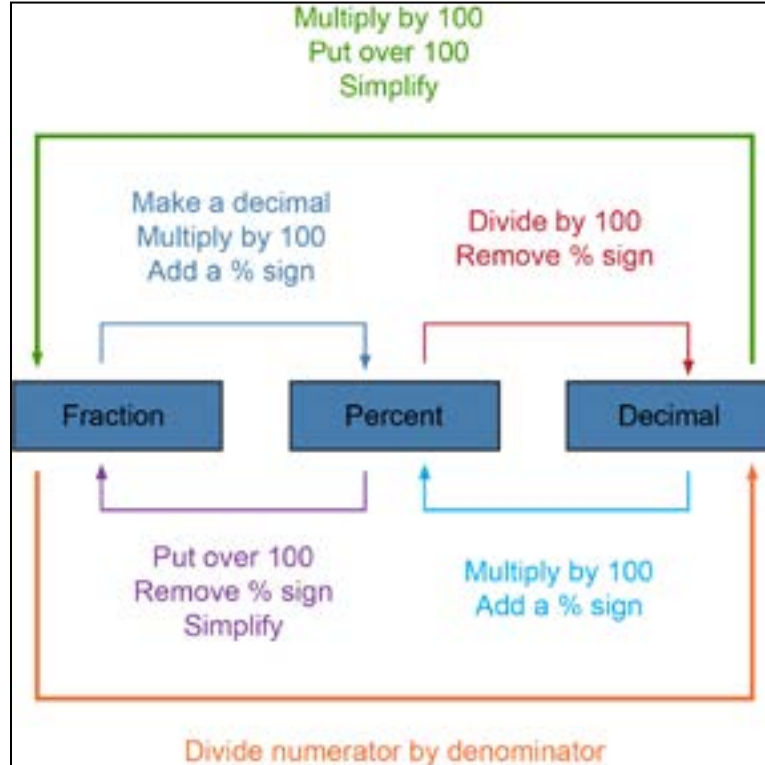
To convert a **fraction to a decimal**, divide the numerator by the denominator.

Example: Write ⁴/₅ as a decimal.
             Divide 4 by 5 to get 0.8

To convert a **decimal to a fraction**, determine the place value of the last digit, such as tenths, hundredths, thousandths, etc. The base 10 number of the last value will be the denominator, so if it ends in the tenths position, the denominator will be 10, or if the last digit is in the thousandths place, the denominator will be 1000. Then place the number without the decimal in the numerator position and simplify.

Example: What is 0.325 as a fraction?

The last digit is in the thousandths place, so the denominator will be 1000
The number without the decimal is 325, so the fraction is ³²⁵/₁₀₀₀
Simplify: ³²⁵/₁₀₀₀ = ¹³/₄₀

Multiply the decimal by 100, then put the number over 100 and simplify if necessary.

Example: What is 0.32 as a fraction?

Multiply 0.32 by 100: 0.32 × 100=32
Now write 32 over 100: $^{32}/_{100}$
Simplify: = $^{32}/_{100}$ = $^{8}/_{25}$

To write a **percent as a decimal**, divide the percent by 100 and remove the percent symbol. This will move the decimal point over to the left by two places.

Example: What is 37.4% expressed as a decimal?

37.4% divided by 100 becomes 0.374

To convert a **decimal to a percent**, multiply the decimal by 100 and add the percent symbol. This will move the decimal point two places to the right.

Example: What is 0.632 written as a percent?

Multiplying 0.632 by 100 moves the decimal point two places to the right: 63.2%

To convert a **fraction to a percent**, convert the fraction to a decimal, then multiply by 100.

Example: What is $^3/_4$ as a percent?

First, convert $^3/_4$ to a decimal by dividing the numerator by the denominator: 3 ÷ 4 = 0.75

Next, multiply the decimal by 100 and add the percent symbol:
$^3/_4$ = 0.75 = 75%

To convert a **percent to a fraction**, remove the percent symbol, and then write the number over 100. Simplify this fraction if necessary.

Example: What is 60% as a fraction?

First, write 60% as a fraction over 100:
60% = $^{60}/_{100}$

Then simplify:
$^{60}/_{100}$ = $^3/_5$

**Measures of Central Tendency**

Mean, median, and mode are all measures of central tendency. They are different ways of describing the center of a series of data points. Range is also a measurement used to describe data.

The **mean** is the average of all of the data points in the set. It is found by adding the values of all of the data points and dividing by the number of data points.

The **median** is the middle number of a set of numbers. It is found by ordering the numbers from least to greatest and selecting the number in the middle. If there is an even number of numbers, the median is the average of the two middle numbers.

The **mode** is the data point in the set that occurs the most often.

The **range** is the difference between the highest and lowest values in the data set.
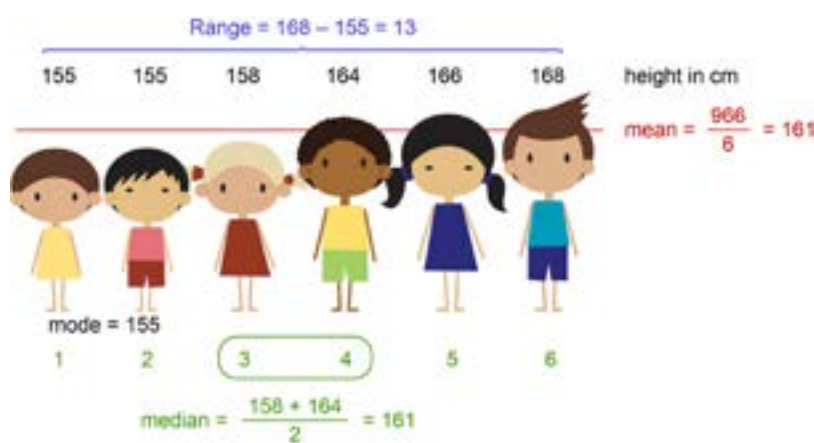
Probability

To find the expected probability of an event, find the likelihood of the desired event and divide it by the number of possible outcomes.

Probability = $\dfrac{\text{likelihood of desired event}}{\text{possible outcomes}}$

Example:

Score	Number of Students
A	3
B	15
C	11
D	7

The table above shows the number of students who earned an A, B, C, or D on a test. If a student was chosen at random, what is the probability they earned a B?

In the table, 15 students earned a B. A total of 36 students took the test.
The probability of choosing a student who earned a B would be 15/36, simplified as 5/12.

Solving for x in Linear Equations

To solve for x in linear equations, it is important to use inverse operations to isolate the variable.

Example: Solve for x in the equation 3x - 4 = 8

$$3x - 4 + 4 = 8 + 4$$
$$3x = 12$$
$$\tfrac{3x}{3} = \tfrac{12}{3}$$
$$x = 4$$

Circle Measurements

It is important to know the parts of a circle in order to find measurements such as the area and circumference of a circle.
The **diameter** is a line segment that runs from one point on the circle to another by passing through the center of the circle.
The **radius** is a line segment that runs from any point on the circle to its center.
The **circumference** of a circle is the perimeter around the circle. It is found by multiplying the diameter by π or multiplying 2π radius.
The **area** of a circle is the area inside of the circle and is found by multiplying π by the radius squared.
Example: Find the circumference and area of a circle with radius 4 inches.

To find circumference: $C = 2\pi r = 2\pi(4) = 8\pi$ in
To find area: $A = \pi r^2 = \pi 4^2 = 16\pi$ in²
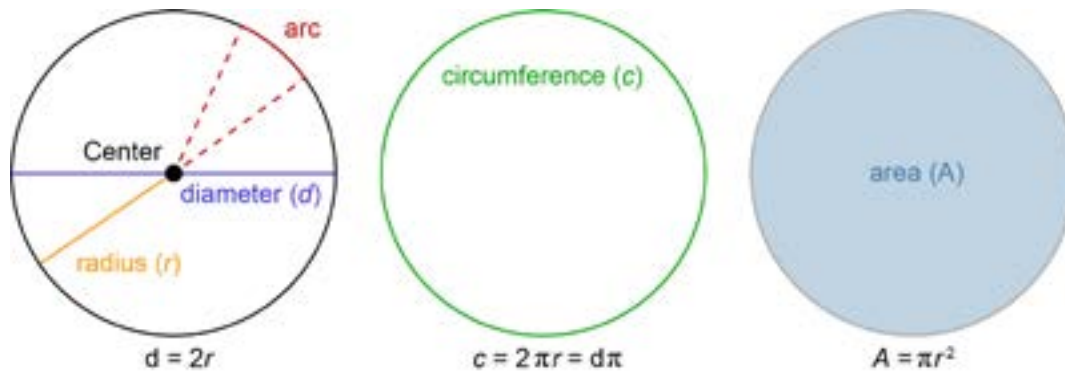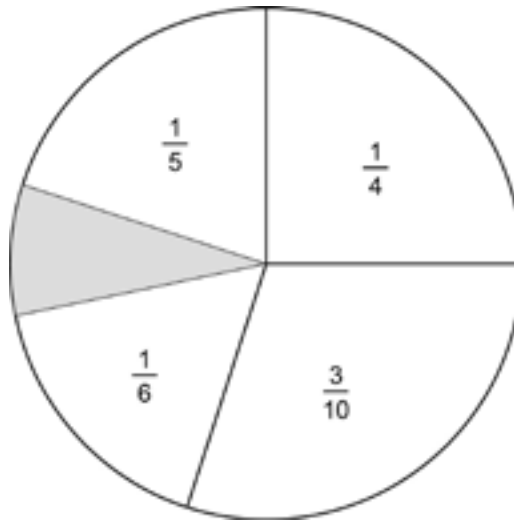

And that's just some very basic information about the Core Mathematics test.

Now, let's look at a few practice questions.

Question 1

A circle is divided into 5 sections and 4 of them are labeled with the fraction of the circle they represent.

What fraction of the total area is the shaded portion?

      A. 1/5
      B. 1/12
      C. 1/6
      D. 1/8

Correct Answer: B. The entire circle can be assumed to have an area of 1. Using the principle of the least common denominator, the area represented by fractions equals:
$1/5 + 1/4 + 3/10 + 1/6 = 12/60 + 15/60 + 18/60 + 10/60 = 55/60$

This can be reduced to $11/12$, which means the remaining fraction represents $1/12$.

Question 2

Bill went to the store to purchase new clothes for the upcoming school year. Bill purchased 8 shirts, 4 pairs of shorts, and 2 pairs of pants. If a single outfit consists of one shirt and either one pair of shorts or one pair of pants, how many outfits can Bill create with the clothes he purchased?

    A. 32
    B. 16
    C. 42
    D. 48

Correct Answer: D. The answer can be found by multiplying the number of shirts by the number of pairs of shorts and pairs of pants. This would create the equation (8 shirts) × (4 pairs of shorts + 2 pair of pants) = 8 × (4 + 2) = 8 × 6 = 48.

Question 3

When Joshua moved into a new apartment, his monthly rent decreased from 35% of his budget to 30%. If his budget is $3,200 a month, how much will the cheaper rent save him annually?

    A. $1,920
    B. $160
    C. $960
    D. $1,120

Correct Answer: A. Joshua will save 5% of $3200 each month, which is $160. To determine the annual savings, multiply 160 by 12: 160 x 12 = $1920.

Question 4

This graph shows the temperature in Chicago on a spring afternoon.
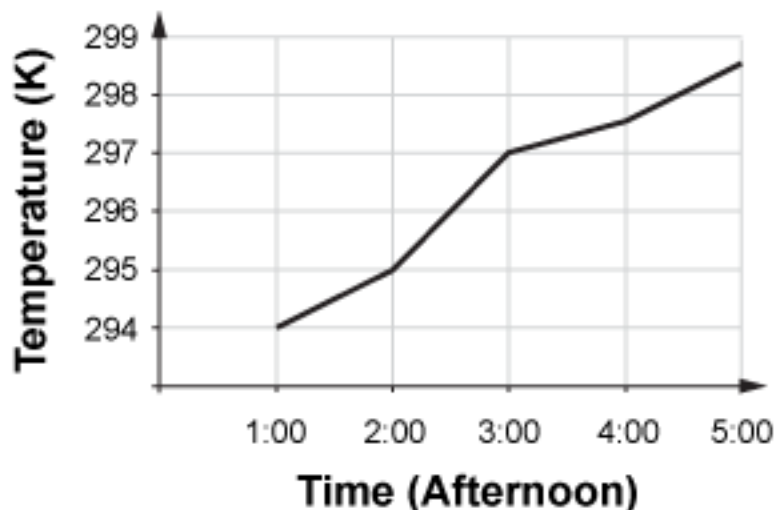
What is the percent increase in temperature from 1:00 PM to 3:00 PM?

    A. 3%
    B. 1%
    C. 9%
    D. 10%

Correct Answer: B. To find the percent change, divide the difference by the original number and multiply by 100%.

In this case, it was 294K at 1pm and 297K at 3 pm.

$$\frac{297 - 294}{294} \times 100\% = 1\%$$

Question 5

Danielle's third-period class began at 10:43 am and ended at 11:38 am. How long was the class?

    A. 45 minutes
    B. 1 hour, 5 minutes
    C. 1 hour, 21 minutes
    D. 55 minutes

Correct Answer: D. One option to determine the length of the class period is to see how long it is from the start of class to the next full hour (from 10:43 am to 11:00 am), and then add the minutes part of the end time. In this case, 11:00 am can be thought of as 10:60 am so that subtraction with 10:43 is easy: 10 – 10 = 0, so 0 hours and 60 – 43 = 17, so it is 17 minutes until 11 am. Then, from 11:00 am to 11:38 am is 38 – 0 = 38 minutes. The total length of the class is 17 + 38 = 55 minutes. Another option to determine the length of the class period would be to reason that if it were an hour long and started at 10:43 am, it would end at 11:43 am. But this class ends at 11:38 am, five minutes before 11:43 am (43 – 38 = 5), and so this class is 5 minutes shorter than 1 hour, or 55 minutes long.

Question 6

A journalist in a town with a population of 15,200 takes a random sample of 200 people and finds that 60 of them read the local newspaper. Based on this sample, which of the following is the best estimate for the number of people in the town that read the local newspaper?

    A. 450
    B. 45
    C. 4500
    D. 5

Correct Answer: C. Of the 200 people sampled, 60/200 or 30% read the paper. 30% of the town's population is (0.30)(15200) = 4560. Therefore about 4500 people read the local paper.

Question 7

Rick pulled a card at random from a normal deck, noted it, replaced it, shuffled, and drew again. He drew a total of ten cards. His draws were as follows: 10, J, 10, K, 1, 2, 6, 10, 11, 4.

What is the probability that he will draw a 10 on the next draw?

    A. 3/10
    B. 1/13
    C. 1/4
    D. 3/8

Correct Answer: B. If the cards are replaced and shuffled, each draw is an independent event. You should ignore the extra information of what he drew so far.
Since there are four 10s in a standard deck of 52 cards, the probability of drawing a 10 is 4/52, or 1/13.
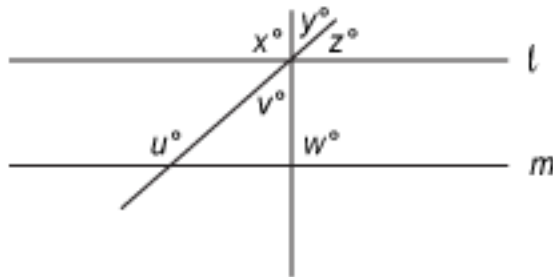
Question 8

Which situation could best be represented by the equation $12x = 54$?

    A. Marty earns $12 for typing a paper. If her rate is $54 per hour, what is x, the number of hours it actually took to type the paper?
    B. Marty collected 12 dozen eggs every day for 54 days. What is x, the total number of dozens of eggs she collected?
    C. Marty had 54 minutes left on her cell phone plan. If she uses 12 minutes, what is x, the number of minutes remaining on her cell phone plan?
    D. Marty made car payments on her car for 54 months until it was paid off. What is x, the number of years it took Marty to pay off her car?

Correct Answer: D. To get the total months, 54, multiply the number of years, x, by the number of months in a year: 12; $12x = 54$.

Question 9

In the figure, line l is parallel to line m. Which of the following equations might not be true?

A. $v° = y°$
B. $x° + y° + z° = 180°$
C. $x° + y° = u°$
D. $w° = 90°$

Correct Answer: D. There is no indicator that this is a right angle, so even if it appears this way, do not assume so unless it is stated or there is a box in the corner.

Question 10

The Trout family just purchased a large table in the shape of a perfect circle. It is 600 cm across. John helps set one side of the table for dinner and walks exactly halfway around the table. Which of the following is closest to how far has he walked?

A. 1,900 cm
B. 1,000 cm
C. 950 cm
D. 600 cm

Correct Answer: C. Since John walked halfway around the table, we are solving for half of the circumference: $C = πd$.

Since the table is 600 cm across, d = 600 cm and therefore P = 600π cm.
John walked halfway around, so John walked ½(600)π, which is about 950 cm.

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