



**NORTH
HENNEPIN**
COMMUNITY COLLEGE
A member of Minnesota State

ENGLISH LANGUAGE FOR ACADEMIC PURPOSES (EAP) ACCUPLACER

**EAP READING SKILLS
EAP SENTENCE MEANING
EAP LISTENING
EAP WRITING**

**ADVANCED ALGEBRA & FUNCTIONS
SUPPLEMENTAL MATH TESTS**

Placement Testing Hours

Monday: 9:00 a.m. or 1:00 p.m.

Tuesday: 3:00 p.m.


Wednesday: 3:00 p.m.

Thursday: 9:00 a.m. or 1:00 p.m.

 <https://www.registerblast.com/nhcc>


TESTING CENTER

EDUCATIONAL SERVICES BUILDING
ROOM 108

 763-424-0928

 testingcenter@nhcc.edu

7411 85th Avenue North
Brooklyn Park, MN 55445

 Intersection of 85th Avenue
and West Broadway

CONTENT

About the EAP Placement Test	Page 2
General Test and Review Information	Page 3
EAP Reading Comprehension	Page 4 – 8
Content Area	Page 4
Sample Questions	Page 5 – 7
Answer Key / Notes	Page 8
EAP Sentence Meaning	Page 9 – 14
Content Area	Page 9
Sample Questions	Page 10 – 13
Answer Key / Notes	Page 14
EAP Listening	Page 15
EAP Writing	Page 16
Common Writing Errors	Page 16 – 17
Math Review	Page 18
Developmental Math	Page 19 – 23
NHCC’s Sample Questions	Page 19 – 23
NHCC Answer Key	Page 23
Next Generation Advance Algebra and Functions	Page 24 – 35
Content Area	Page 24
Accuplacer’s Sample Questions	Page 25 – 30
Accuplacer Answer Key	Page 31
Accuplacer Problem Review	Page 31 – 35
Calculus Readiness	Page 36 – 42
NHCC’s Sample Questions	Page 36 – 42
NHCC Answer Key	Page 42

About the English Language for Academic Purposes (EAP) Tests

Thank you for choosing to pursue your academic, professional, and personal goals here at North Hennepin Community College (NHCC). Please read the following information to help you review for the placement tests.

When students go to college in the U.S., students take placement tests. The purpose of these tests is for class placement. It is important to try to do your best on these tests. The EAP placement tests measure a student's skills in these areas: reading, writing, listening, and vocabulary. The tests place non-native English speakers into EAP courses at NHCC. All courses in the EAP program are designed to help students succeed in the United States' higher education system. The Testing Advisor will discuss test results and course placements with students after the placement test.

The contents of this packet are not intended to be exhaustive or to suggest what will be on the test. Rather, this packet is meant to guide your review of reading, writing, listening, grammar, vocabulary, and math. Take advantage of the resources outlined and invest the time you need to assure appropriate course placement.

We wish you success in all your endeavors here at North Hennepin Community College.

Testing Center Staff

Placement

Course placement in Reading, Listening, Vocabulary, Writing, or Math courses will be at either developmental or college-level. Courses numbered below 1000 are developmental courses designed to prepare students for success in college-level courses. Developmental credits do not apply toward a certificate, diploma, or degree. Courses numbered 1000 or above are considered college-level that meet college-level standards. College credits apply toward the requirements of a certificate, diploma, or degree.

Guidelines

Students must register for courses according to their placement or for a lower course, but not for a higher course. Students may retest only once a semester for a \$10 fee. Students must complete each course with a "C" or better before moving to the next level.

Results for the placement test will be available upon completing the test. The Testing Advisor will explain test results, course placements, the retesting policy, and the next steps in the enrollment process. Information about Online Orientation will be provided following the placement test, and students can schedule the **Registration Session** once a score is received for the writing placement test. Students will register for courses during their Registration Session.

Placement Test Waiver

You may be eligible for a placement test waiver if you have previously completed college-level course work. Please contact the Testing Center with questions about eligibility for a placement test waiver.

General Test & Review Information

How to take the placement test

- Apply to the college: www.nhcc.edu/admissions or in person at the Student Info Desk
- Schedule a placement testing appointment in Registerblast: www.registerblast.com/nhcc/ Monday 9:00 or 1:00, Tuesday 3:00, Wednesday 3:00. Thursday 9:00 or 1:00.
- Review! Use this study packet and other recommended resources listed below.
- Show up! Bring photo identification (passport, state ID, driver's license) to your appointment. We cannot allow students to test without identification. Arrive at least 15 minutes early to check-in for your appointment. You will have one hour to write the essay. The other tests are not timed. However, you should assume that it will take approximately two hours to complete the computerized test.

Preparing for the Placement Tests

We strongly recommend that you review for the tests, so that your results reflect your true ability. Here are a few websites to help you review.

- ❖ **Accuplacer Study App** – Create an account and log in to take “ESL Practice Tests”. Practice the ESL Reading, ESL Listening, and ESL Sentence Meaning tests. Select “Learn as You Go” to show the correct answer and receive rationale for the answer to each question. For Math, switch to “Next Generation Practice Tests”, we only use “Advanced Algebra and Functions.”
<https://accuplacerpractice.collegeboard.org/login>
- ❖ **Exam English** – Use the English TOEFL practice reading, listening, sentence structure, and vocabulary tests at <http://www.examenglish.com/TOEFL/index.php>.
- ❖ **Union Test Prep** – Practice the Accuplacer tests for ESL Reading, ESL Sentence Meaning, and three levels of math. <https://uniontestprep.com/accuplacer-test/practice-test>
- ❖ **Study Guide** – Under Goals select “College Placement Exams” and “Accuplacer Exams”. View the lessons and practice tests under ESL Reading, ESL Listening, ESL Sentence Meaning, Writeplacer, Advanced Algebra. <https://study.com/academy/goal/test-prep.html>
- ❖ **PETT** – Practice ESOL Listening tests <https://www.seminolestate.edu/adult-ed/els/pett/>
- ❖ **EAP Writing** – Review essay organization.
<http://writing.umn.edu/sws/assets/pdf/quicktips/academicessaystructures.pdf>
- ❖ **EAP Grammar** – Practice grammar exercises at www.englishpage.com

Additional Math resources

- ❖ **Math Help** – Review individual content areas covered in Accuplacer math tests, with online practice tests and instruction. https://member.mathhelp.com/courses/test_prep/151.
- ❖ **Test Prep Review** – Online practice tests for **Math**. Provides additional self-assessment modules. <https://www.mometrix.com/academy/accuplacer-test/next-generation-accuplacer/next-generation-accuplacer-advanced-algebra-and-function/>.
- ❖ **Study Guide Zone** – Practice tests for Reading and Advanced Algebra. Includes skillbuilding exercises focused on content. <https://www.studyguidezone.com/accuplacertest.htm>.
- ❖ **Khan Academy** – Resources with video tutorials of math topics. <http://www.khanacademy.org>.
- ❖ **IXL** – Review [Algebra 1](#), [Algebra 2](#), [Geometry](#), and [Precalculus](#). <https://www.ixl.com/math/>.

EAP READING TEST

Purpose: The Accuplacer EAP Reading Test measures a student's understanding of what they have read.

Length: 20 questions

Format: Multiple choice

You will read short passages of 50 to 90 words. Half of this test contains comprehension questions (paraphrase, locating information, vocabulary on a phrase level, and pronoun reference). The other half assesses inference skills (main idea, fact vs. opinion, cause/effect logic, identifying irrelevant information, author's point of view and applying the author's logic to another situation).

Helpful tip: During the test, take the time to read each passage and the questions again before choosing your answer.

Practice test and review websites: Take the reading practice test below. The answers are at the end of the test. Try more practice tests at:

- ❖ <https://accuplacerpractice.collegeboard.org/login>
- ❖ http://www.examenglish.com/TOEFL/TOEFL_reading1.htm
- ❖ http://www.examenglish.com/TOEFL/TOEFL_reading2.htm
- ❖ http://www.examenglish.com/TOEFL/TOEFL_reading3.htm
- ❖ http://www.examenglish.com/TOEFL/toefl_reading.htm
- ❖ <https://uniontestprep.com/accuplacer-test/practice-test/esl-reading-skills/pages/1>

Review websites: Use these resources for helpful study guides and tips.

- ❖ <https://study.com/academy/course/accuplacer-esl-reading-skills-test-practice-study-guide.html>

EAP Reading Skills Sample Questions

Read the information below, then choose the best answer.

1. Television has been introduced to almost every country in the world, reaching a large number of viewers on every continent. About 600 million people saw the first person walk on the moon, and a billion people watched the twentieth Olympic Games. Television has in many ways promoted understanding and cooperation among people. It does this by showing educational and cultural programs.

From this passage, a reader can most reasonably conclude that the author believes that

- A. people spend too much time watching television
 - B. not every country needs to have television
 - C. television can unify people from around the world
 - D. television is as important as schools
2. People have different ways of learning. Some are better at making mental pictures of new ideas. Others are more comfortable with writing lists of things to memorize. Certain people can learn best when listening to music, while others need silence to concentrate.

Which of the following is the main idea of the passage?

- A. Mental pictures help many to learn.
 - B. Some people prefer lists to making mental pictures.
 - C. To learn well you need to be comfortable.
 - D. Different individuals have different ways of acquiring information.
3. If you hold a piece of copper wire over the flame of a wooden match, heat will be conducted by the copper wire to your fingers, and you will be forced to drop the wire. You will, however, still be able to hold the match because wood is a poor conductor of heat.

Which of the following is implied in the passage above?

- A. Copper is a good conductor of heat.
- B. Wood and copper conduct heat equally.
- C. Wood is an excellent conductor of heat.
- D. Matches should be made of copper.

4. Many people own different pets. Dogs, cats, birds, and fish are common household pets. Others pets are considered to be exotic animals. These include snakes, lizards, and hedgehogs.

According to the passage, snakes are

- A. uncommon pets
 - B. likely to be found in a household with dogs
 - C. found only in zoos
 - D. not allowed in people's homes
5. Cesar Chavez was an influential leader for farmworkers. He fought for their rights and better working conditions. Chavez led many strikes that angered farm owners. Eventually he succeeded in getting increased wages and better living situations for farmworkers.

The passage indicates that Chavez changed lives by

- A. helping to end the farmworkers' strikes
 - B. fighting for the rights of farm owners
 - C. working on the farms every day
 - D. improving the conditions for farmworkers
6. When cartoonist Charles M. Schulz was a boy in elementary school, other boys teased him for being small and not very good at sports, and his art teacher told him he had no talent for drawing. He had few friends and was too shy to talk to a red-haired girl he admired. Later in life, Schulz used his childhood experiences in his comic strip *Peanuts*: the strip's main character, the sad and lonely Charlie Brown, represents Schulz as a little boy. *Peanuts* was unique at the time because it contained no adult characters. Readers fell in love with Charlie Brown, and *Peanuts* eventually became one of the most popular comic strips of all time.

What is the main idea of the passage?

- A. *Peanuts* was the world's most widely read comic strip.
- B. Schulz was a very famous cartoonist.
- C. Schulz turned the pain of his youth into success as an adult.
- D. The comic strip *Peanuts* featured children as its only characters.

7. Money has been used for thousands of years in nearly every culture as a means of exchange. However, today, the use of cash is becoming less and less common in modern societies all over the world. Every year, a higher percentage of purchases are made online, and even in stores customers are now using credit cards more often than cash. Many people today do all of their banking on the Internet rather than going to the bank in person.

The author of the passage probably assumes that

- A. cash will become virtually obsolete in the near future
 - B. using cash will become popular again
 - C. paying with credit cards all the time is dangerous
 - D. societies that do business online will struggle
8. Before giving first aid to an accident victim, you should obtain his or her consent. Asking for consent takes a simple question. Say to the victim, “I know first aid, and I can help until an ambulance arrives. Is that okay?”

According to the passage, it is wrong to

- A. use first aid on an accident victim without medical training
 - B. attempt to help an accident victim without permission
 - C. help a victim before an ambulance arrives
 - D. call for an ambulance instead of helping the victim
9. Dr. Ellen Ochoa is an inventor and is also the first female Hispanic astronaut. Her inventions include technology to help robots inspect equipment in space to maintain safety and quality control on spacecraft. Before retiring, she logged more than 1,000 hours in space across several space missions.

According to the passage, Dr. Ochoa is the first

- A. Hispanic person to travel into space
- B. inventor to travel into space
- C. woman to travel into space
- D. Hispanic woman to travel into space

10. Dogs and cats make very different types of pets. Before deciding whether to buy or adopt a dog or a cat, prospective owners need to carefully consider their own lifestyles and personalities. Dogs may make more affectionate companions, but they require more care and attention. They must be taken out several times a day and should not be left alone for more than a few hours. Larger dogs require significant exercise to remain fit and healthy. Cats are usually more independent in nature and interact less with their owners. Also, a cat can be left on its own all day, or even for several days, as long as it has food and clean water to drink.

From this passage, a reader can conclude that

- A. owning a cat requires less work than owning a dog
- B. people who are away from home during the day should not own a cat
- C. people who like to play with their pets should own a cat
- D. owning a cat is more responsibility than owning a dog

EAP Reading Skills Answer Key

1	2	3	4	5	6	7	8	9	10
C	D	A	A	D	C	A	B	D	A

Notes

SENTENCE MEANING (VOCABULARY) TEST

Purpose: The Accuplacer EAP Sentence Meaning Test measures how well you understand the meaning of sentences in English.

Length: 20 questions

Format: Multiple choice

The Sentence Meaning test measures your understanding of word meanings in one- or two-sentence contexts. The sentences are taken from the subject areas of natural science, history/social studies, arts/humanities, psychology/ human relations, and practical situations.

There are four content areas measured: (a) Particle, Phrasal Verbs, Prepositions of Direction; (b) Adverbs, Adjectives, Connectives Sequence; (c) Basic Nouns and Verbs; and (d) Basic and Important Idioms.

Helpful tip: During the test, take the time to read each sentence and the questions again before choosing your answer.

Practice tests: Take the sentence meaning practice test. The answers are at the end of the test. Additional online practice tests are listed below:

- ❖ <https://accuplacerpractice.collegeboard.org/login>
- ❖ <https://uniontestprep.com/accuplacer-test/practice-test/esl-sentence-meaning/pages/1>
- ❖ http://www.examenglish.com/TOEFL/toefl_structure_1.htm
- ❖ http://www.examenglish.com/TOEFL/toefl_structure_2.htm
- ❖ http://www.examenglish.com/TOEFL/toefl_structure_3.htm
- ❖ http://www.examenglish.com/TOEFL/toefl_structure_4.htm

Grammar review websites: Use these resources for helpful study guides and tips.

- ❖ <https://study.com/academy/course/accuplacer-esl-sentence-meaning-test-practice-study-guide.html>
- ❖ <http://www.examenglish.com/grammar/index.html>
- ❖ <https://elt.oup.com/student/practicegrammar/test?cc=us&selLanguage=en>
- ❖ <http://www.roadtogrammar.com/>

EAP Sentence Meaning Sample Questions

Directions for questions 1–8:

The sentence below has a blank space. Choose the word or phrase that makes the sentence meaningful and correct.

1. Shikibu Murasaki, who wrote almost a thousand years ago, was one of the world's _____ novelists.
 - A. most early
 - B. too early
 - C. more early
 - D. earliest
2. The Chang children _____ their parents by making sandwiches for the whole family.
 - A. helped out
 - B. helped with
 - C. helps for
 - D. helps to
3. As demonstrated by his last album, which was released after his death, Ibrahim Ferrer _____ one of the most beautiful voices in Latin music.
 - A. had
 - B. have
 - C. have had
 - D. having
4. After we saw the play, we had different opinions _____ Vincent's performance.
 - A. about
 - B. at
 - C. for
 - D. to

5. Having recorded many of the most beloved songs of the 1940's, jazz singer Ella Fitzgerald _____ one of the most prominent musical performers of her time.
- A. had been
 - B. has been
 - C. was
 - D. will be
6. As we drove through the darkness, we saw another car coming _____ the bend in the road.
- A. through
 - B. under
 - C. over
 - D. around
7. Sonia is so determined and stubborn that she never _____ until she gets exactly what she wants.
- A. gives up
 - B. gives out
 - C. gave in
 - D. gave away
8. At only 43, John F. Kennedy was the _____ American president ever to be elected.
- A. most young
 - B. more young
 - C. youngest
 - D. younger

Directions for questions 9–15:

Each problem contains one or two sentences followed by a question. Choose the correct answer to the question.

9. Elena found a tomato that was much bigger than all the others in the garden.

How did the tomato compare to the others in the garden?

- A. It was the smallest.
- B. It was not very large.
- C. It was larger than some.
- D. It was the largest.

10. When the popular entertainer canceled her appearance, the Latin American festival was postponed indefinitely.

When will the festival likely take place?

- A. Tonight
- B. Tomorrow
- C. Next week
- D. Many weeks later

11. Jasmine is never late to meet her friends, and sometimes arrives a few minutes early.

Which best describes Jasmine?

- A. Lonely
- B. Punctual
- C. Talkative
- D. Tardy

12. Bram Stoker is best known for his classic horror novel *Dracula*, which was published in 1897.

What did Bram Stoker do?

- A. He was a doctor.
- B. He was a merchant.
- C. He was a writer.
- D. He was an engineer.

13. Exhausted from her transatlantic flight, Judy could not stay up past 9 p.m.

What did Judy do at 9 p.m.?

- A. Leave work
- B. Come home from the airport
- C. Get on an airplane
- D. Go to bed

14. Eliot sleeps late whenever he can, leaves work early, and never does anything unless he absolutely has to.

Which best describes Eliot?

- A. Boring
- B. Lazy
- C. Selfish
- D. Tired.

15. Juanita rushed to her dance class and burst through the door in the nick of time.

When Juanita got to her dance class, she was

- A. very early
- B. very late
- C. nearly late
- D. a little late

EAP Sentence Meaning Answer Key

1	2	3	4	5	6	7	8
D	A	A	A	C	D	A	C
9	10	11	12	13	14	15	
D	D	B	C	D	B	C	

Notes

EAP LISTENING TEST

Purpose: The Accuplacer EAP Listening Test measures your ability to understand spoken English in a variety of situations. The conversations may take place at work, home, or school.

Length: 20 questions

Format: Multiple choice

First, you will listen to a spoken conversation, followed by a spoken question. The possible answers to the question are spoken and written. You will be asked to choose the best answer.

Helpful tip: During the test, you have the ability to listen to each section two more times by clicking on the “play” button next to each section.



The first time the test reads through each section, use that opportunity to select what you think is the best answer. Select “Play” to repeat the spoken conversation and spoken question, then determine if you still think the answer you originally selected is correct. You will still have one more opportunity to listen to the spoken conversation and spoken question before you move on to the next question. You can change your answer multiple times, but once you submit the answer and move on to the next question you cannot go back to the previous question. When you move to the next question it will start the spoken conversation immediately, be prepared.

Practice Tests: Take the listening practice tests below. You can check your answers throughout the tests.

- ❖ <https://accuplacerpractice.collegeboard.org/login>
- ❖ <https://uniontestprep.com/accuplacer-test/practice-test/esl-listening/pages/1>
- ❖ https://www.examenglish.com/TOEFL/TOEFL_listening_conversation1.htm
- ❖ https://www.examenglish.com/TOEFL/TOEFL_listening_conversation2.htm
- ❖ https://www.examenglish.com/TOEFL/TOEFL_listening_conversation3.htm
- ❖ <https://www.seminolestate.edu/adult-ed/els/pett/listening>

Review websites: Use these resources for helpful study guides and tips.

- ❖ <http://study.com/academy/course/accuplacer-esl-listening-test-practice-study-guide.html>
- ❖ <http://www.esl-lab.com/>

WRITING TEST

Purpose: The Writing Test measures your ability to organize and communicate your ideas effectively in formal writing. The essay you write will decide the level of your first writing class here at North Hennepin Community College. It is important for you to do your very best writing.

Length: 60 minutes

Format: Write an essay of 4-5 paragraphs, with an introduction, a body, and a conclusion.

- In your introduction paragraph, include a thesis statement that gives the main points you will explain in your essay.
- For each body paragraph, include a topic sentence, specific information about your main point, and a concluding sentence
- Your concluding paragraph should provide a final idea about the main points in your essay.

Helpful tip: Write as much as you can in the time you have. Organize your ideas clearly and explain each idea completely. Carefully check your writing for correct grammar, spelling and punctuation.

Essay organization: <http://writing.umn.edu/sws/assets/pdf/quicktips/academicessaystructures.pdf>

Review grammar: www.englishpage.com

Common Writing Errors

<u>SINGULAR AND PLURAL NOUNS</u>	<u>ARTICLES</u>
<i>Incorrect:</i> She needs two book for this class.	<i>Incorrect:</i> We saw good movie yesterday.
<i>Correct:</i> She needs two book ^(s) for this class.	<i>Correct:</i> We saw ^(a) good movie yesterday.
<u>POSSESSIVE NOUNS</u>	<u>WORD FORM</u>
<i>Incorrect:</i> John notebook is on the table.	<i>Incorrect:</i> I saw a beauty picture.
<i>Correct:</i> John ^(’s) notebook is on the table.	<i>Correct:</i> I saw a <u>beautiful</u> picture.
<u>WORD CHOICE</u>	<u>SUBJECT/VERB AGREEMENT</u>
<i>Incorrect:</i> I like to drive my horse.	<i>Incorrect:</i> He like to study at the library.
<i>Correct:</i> I like to <u>ride</u> my horse.	<i>Correct:</i> He like ^(s) to study at the library.

<p style="text-align: center;"><u>VERB FORM</u></p> <p><i>Incorrect:</i> They are study English.</p> <p><i>Correct:</i> They are <u>studying</u> English.</p>	<p style="text-align: center;"><u>VERB TENSE</u></p> <p><i>Incorrect:</i> We study for the test yesterday.</p> <p><i>Correct:</i> We <u>studied</u> for the test yesterday.</p>
<p style="text-align: center;"><u>PREPOSITIONS</u></p> <p><i>Incorrect:</i> We started studying 6:00 p.m.</p> <p><i>Correct:</i> We started studying <u>at</u> 6:00 p.m.</p>	<p style="text-align: center;"><u>WORD ORDER</u></p> <p><i>Incorrect:</i> I saw five times that movie.</p> <p><i>Correct:</i> I saw <u>that movie five times</u></p>
<p style="text-align: center;"><u>REPEATED SUBJECT</u></p> <p><i>Incorrect:</i> My friend she wants to go to school.</p> <p><i>Correct:</i> My friend she wants to go to school.</p>	<p style="text-align: center;"><u>MISSING SUBJECT OR VERB</u></p> <p><i>Incorrect:</i> Took his mother to the doctor.</p> <p><i>Correct:</i> <u>He</u> took his mother to the doctor.</p>
<p style="text-align: center;"><u>SPELLING</u></p> <p><i>Incorrect:</i> I recieved the gift from my family.</p> <p><i>Correct:</i> I <u>re</u>ceived the gift from my family.</p>	<p style="text-align: center;"><u>CAPITALIZATION</u></p> <p><i>Incorrect:</i> We are studying english.</p> <p><i>Correct:</i> We are studying <u>E</u>nglish.</p>
<p style="text-align: center;"><u>PUNCTUATION: RUN-ON</u></p> <p><i>Incorrect:</i> We enjoyed reading the book we recommended it to our friends.</p> <p><i>Correct:</i> We enjoyed reading the book. <u>We</u> recommended it to our friends.</p>	<p style="text-align: center;"><u>PUNCTUATION: COMMA-SPLICE</u></p> <p><i>Incorrect:</i> We enjoyed reading the book, we recommended it to our friends.</p> <p><i>Correct:</i> We enjoyed reading the book. <u>We</u> recommended it to our friends.</p>
<p style="text-align: center;"><u>PUNCTUATION: FRAGMENT</u></p> <p><i>Incorrect:</i> Before I go to school. I eat breakfast.</p> <p><i>Correct:</i> Before I go to school, <u>I</u> eat breakfast.</p>	<p style="text-align: center;"><u>CONJUNCTIONS/TRANSITIONS</u></p> <p><i>Weak:</i> Traffic was bad. They arrived late.</p> <p><i>Better:</i> Traffic was bad, <u>so</u> they arrived late.</p>

Math Placement Test

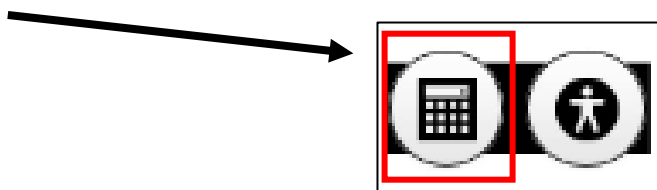
Structure

The math placement test is designed to measure student's understanding of content areas in Arithmetic, Algebra, Geometry, Functions and Trigonometry. The test begins with the ACCUPLACER Next Generation Advanced Algebra and Functions test, which has 20 questions, and will either place students into a College Math class based on that score, or require additional tests for placement. An Advanced Algebra and Functions score of less than 235, will start the Developmental Math test with 18 questions. An Advanced Algebra and Functions score of more than 261, will start the Calculus Readiness test with 10 questions. Test scores and placement are available immediately after completing the test. The Testing Advisor will explain test results and course placements to each student.

Guidelines

The placement test is not timed. Students are **not permitted** to use a personal calculator, a calculator tool on the computer or the Internet. The ACCUPLACER calculator is the only calculator students may use, and it only appears on certain questions.

A calculator button will be displayed right next to the Accessibility button on the toolbar.



The sample questions in this packet are not intended to be exhaustive, but to aid the student's review of certain math concepts. The first set of problems was developed by faculty at NHCC, including a review section, which explains how to solve the problems. The second set of questions is from College Board, the creators of the ACCUPLACER. To aid study, external study resources and practice questions are listed on the previous page.

Students are **highly encouraged to review** for the math placement test before taking it. Take advantage of the resources and references provided by the Testing Center, as well as others you are aware of that may help your performance on the test.

Developmental Math Practice Questions

Calculators not allowed

1. Simplify: $-7 - (-4)$

- a. 3
- b. -3
- c. -11
- d. 11
- e. 28

2. Simplify: $-7 + (-4)$

- a. 3
- b. -3
- c. -11
- d. 11
- e. 28

3. Simplify: $10 - (-5)$

- a. 15
- b. 5
- c. -5
- d. -2
- e. -15

4. Simplify: $-10 + 5$

- a. 15
- b. 5
- c. -5
- d. -2
- e. -15

5. Simplify: $-30 \div (-5)$

- a. -35
- b. -6
- c. -5
- d. 5
- e. 6

6. Simplify: $-35 \div 7$

- a. -28
- b. -6
- c. -5
- d. 5
- e. 6

7. Simplify: $\frac{8}{3} - \frac{2}{3}$

- a. 6
- b. $\frac{10}{3}$
- c. 2
- d. 1
- e. $\frac{5}{3}$

8. Simplify: $1\frac{2}{3} + \frac{1}{3}$

- a. 6
- b. $\frac{10}{3}$
- c. 2
- d. 1
- e. $\frac{5}{3}$

9. Simplify: $\frac{3}{4} + \frac{1}{3}$

a. $\frac{4}{7}$

b. $\frac{2}{7}$

c. $\frac{2}{3}$

d. $\frac{13}{12}$

e. $\frac{5}{12}$

10. Simplify: $\frac{2}{15} + \frac{2}{3}$

a. $\frac{4}{5}$

b. $\frac{2}{9}$

c. $\frac{4}{18}$

d. $\frac{4}{15}$

e. $\frac{5}{12}$

11. Simplify: $\frac{4}{7} \times \frac{7}{16}$

a. $\frac{11}{23}$

b. $\frac{11}{4}$

c. $\frac{64}{49}$

d. $\frac{5}{4}$

e. $\frac{1}{4}$

12. Simplify: $\frac{5}{9} \times \frac{6}{25}$

a. $\frac{11}{23}$

b. $\frac{11}{4}$

c. $\frac{2}{15}$

d. $\frac{5}{4}$

e. $\frac{1}{4}$

13. Simplify: 1000×0.0372

a. 3.72

b. 0.000372

c. 0.00372

d. 372

e. 37.2

14. Simplify: $0.0372 \div 100$

a. 3.72

b. 0.000372

c. 0.00372

d. 372

e. 37.2

15. Simplify: $3 - 1.75$

- a. 4.75
- b. 1.75
- c. 1.25
- d. 1.72
- e. 0.75

16. Simplify: $5.8 + 3.55$

- a. 9.35
- b. 4.13
- c. 1.25
- d. 8.35
- e. 11.15

17. Simplify: $2 + 2 \times 4 - 3$

- a. 13
- b. 4
- c. 9
- d. 7
- e. 15

18. Simplify: $24 \div 2 \times 6 - 4$

- a. -2
- b. 24
- c. 6
- d. -18
- e. 68

19. Simplify: $7 - (2 + 9)$

- a. 14
- b. -4
- c. 18
- d. 4
- e. -14

20. Simplify: $7 - 8(3 - 5) + 15$

- a. 38
- b. 17
- c. 6
- d. 4
- e. -14

**21. Evaluate the expression $\frac{1}{3}ab$
when $a = 5$ and $b = 6$ and simplify**

- a. 10
- b. 20
- c. 1
- d. $\frac{11}{3}$
- e. 80

**22. Evaluate the expression $\frac{1}{2}h(B+b)$
when $h = 7$, $B = 3$, $b = 5$ and simplify**

- a. 14
- b. 20
- c. 28
- d. $11\frac{1}{2}$
- e. 80

**23. Evaluate the expression $(a + b)^2$
when $a = 5$ and $b = 3$ and simplify**

- a. 34
- b. 64
- c. 225
- d. 16
- e. 45

**24. Evaluate $\frac{-b + \sqrt{b^2 - 4ac}}{2a}$
when $a = 3$, $b = -5$, $c = -2$ and simplify**

- a. 1
- b. 2
- c. 3
- d. 6
- e. 9

25. Simplify: $(2 - 5)^2 + 9 \div 3$

- a. -6
- b. 0
- c. 6
- d. 12
- e. 2

26. Simplify: $15 - (9 - 6)^2 + 45 \div 15$

- a. -99
- b. 0
- c. 9
- d. 12
- e. 2

27. Simplify: $4(x - 2) - 3(x - 1)$

- a. $7x - 11$
- b. $7x - 8$
- c. $x - 11$
- d. $x - 5$
- e. $x - 3$

28. Simplify: $-3(y + 5) + 4(y - 5)$

- a. $7y - 5$
- b. $7y - 35$
- c. $y - 5$
- d. $35y$
- e. $y - 35$

29. Simplify: $3a + 2b - 5a - 4a + 2b + 3$

- a. $-12a + 4b + 3$
- b. $-6a + 4b + 3$
- c. $3a + 6b + 3$
- d. $-a + 7b$
- e. ab

30. Simplify: $-5x + 9y - 5x - 8 + 3x + 7$

- a. $-7x + 9y - 1$
- b. $3x + 9y + 15$
- c. $-7x - 1$
- d. $-7x + 9y - 15$
- e. $12xy - 1$

31. Solve: $2(a + 5) = -4(a - 4)$

- a. $a = 4$
- b. $a = 1$
- c. $a = 2$
- d. $a = \frac{1}{3}$
- e. $a = -1$

32. Solve: $4 - 3(x + 8) = 2(x + 5)$

- a. $x = 6$
- b. $x = 2$
- c. $x = -6$
- d. $x = -2$
- e. $x = \frac{18}{5}$

33. Solve: $2x - 1 = 5x + 8$

- a. $x = 3$
- b. $x = -2$
- c. $x = 1$
- d. $x = \frac{1}{3}$
- e. $x = -3$

34. Solve: $-2(w - 1) = 8 - 3(w + 2)$

- a. $w = 4$
- b. $w = -4$
- c. $w = \frac{12}{5}$
- d. $w = 0$
- e. $w = -2$

35. Solve: $2 + x + 7x = 7 - 2x + 10$

- a. $x = 15$
- b. $x = \frac{2}{3}$
- c. $x = 3$
- d. $x = \frac{3}{2}$
- e. $x = -1$

36. Solve: $y + 7 - 3y = 7 - 5y + 10$

- a. $x = 15$
- b. $y = \frac{10}{3}$
- c. $x = 3$
- d. $x = \frac{3}{2}$
- e. $x = -1$

Developmental Math Answer Key

1	2	3	4	5	6	7	8	9	10	11	12
B	C	A	C	E	C	C	C	D	A	E	C

13	14	15	16	17	18	19	20	21	22	23	24
E	B	C	A	D	E	B	A	A	C	B	B

25	26	27	28	29	30	31	32	33	34	35	36
D	C	D	E	B	A	B	C	E	D	D	B

ACCUPLACER Advanced Algebra and Functions

Sample Questions

The Next-Generation Advanced Algebra and Functions placement test is a computer adaptive assessment of test-takers' ability for selected mathematics content. Questions will focus on a range of topics, including a variety of equations and functions, including linear, quadratic, rational, radical, polynomial, and exponential. Questions will also delve into some geometry and trigonometry concepts. In addition, questions may assess a student's math ability via computational or fluency skills, conceptual understanding, or the capacity to apply mathematics presented in a context. All questions are multiple choice in format and appear discretely (stand alone) across the assessment. The following knowledge and skill categories are assessed:

- Linear equations
- Linear applications
- Factoring
- Quadratics
- Functions
- Radical and rational equations
- Polynomial equations
- Exponential and logarithmic equations
- Geometry concepts
- Trigonometry

Advanced Algebra and Functions Sample Questions

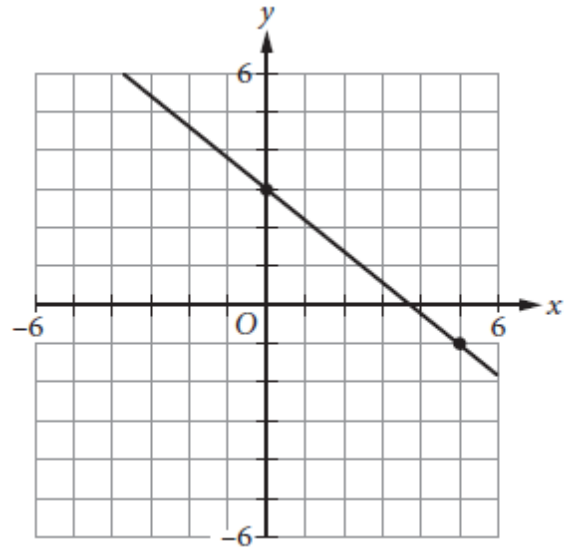
Choose the best answer. If necessary, use the paper you were given.

1. Function g is defined by $g(x) = 3(x + 8)$. What is the value of $g(12)$?

A. -4
B. 20
C. 44
D. 60

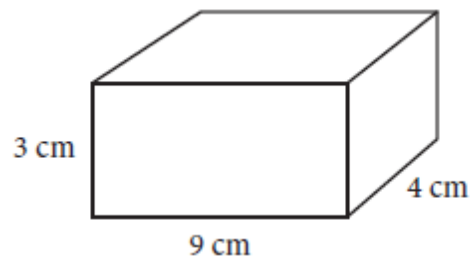
2. Which of the following is an equation of the line that passes through the point $(0, 0)$ and is perpendicular to the line shown above?

A. $y = \frac{5}{4}x$
B. $y = \frac{5}{4}x + 3$
C. $y = -\frac{4}{5}x$
D. $y = -\frac{4}{5}x + 3$



3. The surface area of a right rectangular prism can be found by finding the sum of the area of each of the faces of the prism. What is the surface area of a right rectangular prism with length 4 centimeters (cm), width 9 cm, and height 3 cm? (Area of a rectangle is equal to length times width.)

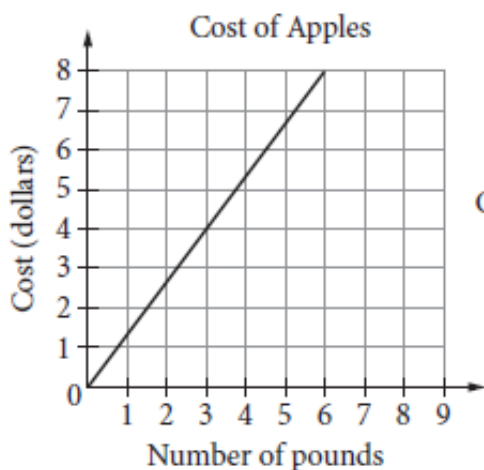
A. 75 cm^2
B. 108 cm^2
C. 120 cm^2
D. 150 cm^2



4. Which of the following expressions is equivalent to $(x + 7)(x^2 - 3x + 2)$?

A. $x^3 - 3x^2 + 2x + 14$
B. $x^3 + 4x^2 - 19x + 14$
C. $x^3 - 3x + 14$
D. $x^2 - 2x + 9$

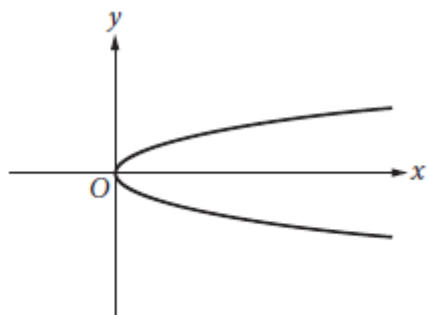
5. The graph below shows the cost, in dollars, of apples as a function of the number of pounds of apples purchased at a particular grocery store. The equation above defines the cost C , in dollars, for p pounds of pears at the same store. Which of the following statements accurately compares the cost per pound of apples and the cost per pound of pears at this store?



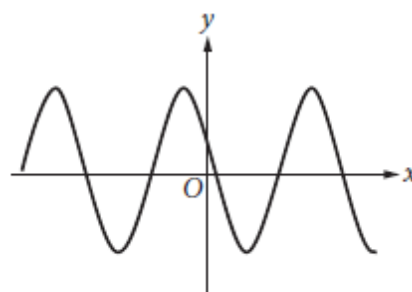
Cost of Pears: $C = \frac{7}{5}p$

- A. Apples cost approximately \$0.07 less per pound than pears do.
 B. Apples cost approximately \$0.04 less per pound than pears do.
 C. Apples cost approximately \$0.73 less per pound than pears do.
 D. Apples cost approximately \$0.62 more per pound than pears do.
6. Which of the following is the graph of a function where $y=f(x)$?

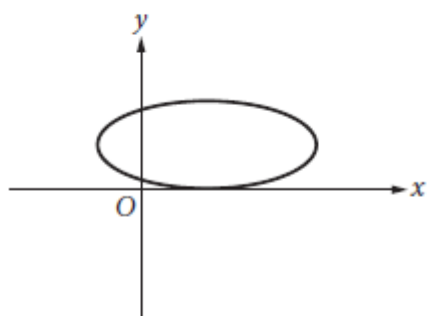
A.



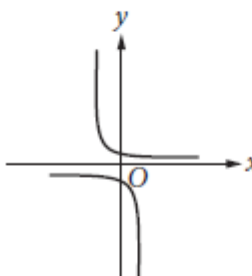
C.



B.



D.



7. Which of the following expressions is equivalent to $3x^2 + 6x - 24$?

- A. $3(x + 2)(x - 4)$
- B. $3(x - 2)(x + 4)$
- C. $(x + 6)(x - 12)$
- D. $(x - 6)(x + 12)$

8. A biologist puts an initial population of 500 bacteria into a growth plate. The population is expected to double every 4 hours. Which of the following equations gives the expected number of bacteria, n , after x days? (24 hours = 1 day)

- A. $n = 500(2)^x$
- B. $n = 500(2)^{6x}$
- C. $n = 500(6)^x$
- D. $n = 500(6)^{2x}$

9. $x^2 + 5x - 9 = 5$

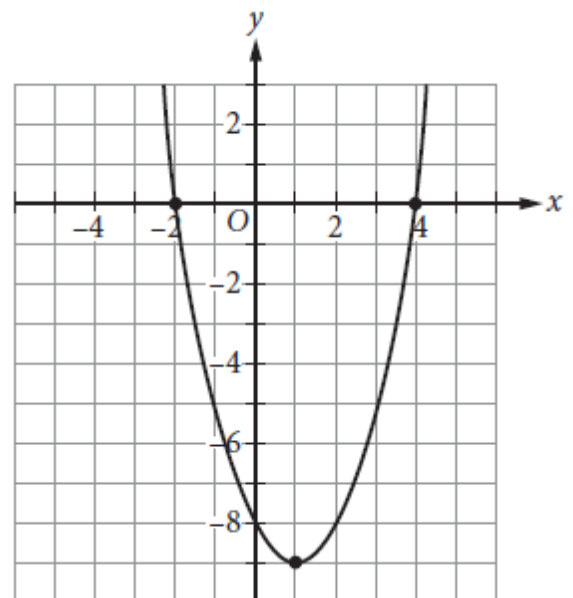
Which of the following values of x satisfies the equation above?

- A. 7
- B. 3
- C. -2
- D. -7

10. The graph of $y = f(x)$ is shown in the xy -plane.

Which of the following equations could define $f(x)$?

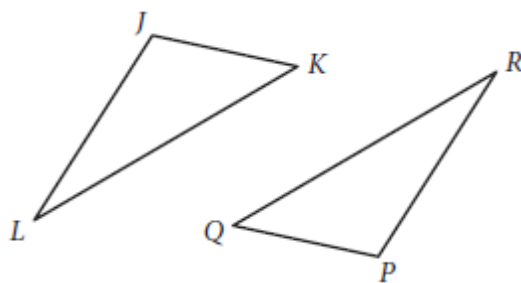
- A. $f(x) = x^2 - 2x - 8$
- B. $f(x) = -x^2 + 2x - 8$
- C. $f(x) = (x - 2)(x + 4)$
- D. $f(x) = -(x - 1)^2 - 9$



11. Which of the following best describes the range of $y = -2x^4 + 7$
- A. $y \leq -2$
 - B. $y \geq 7$
 - C. $y \leq 7$
 - D. All real numbers
12. For which of the following equations is $x = 6$ the only solution?
- A. $(6x)^2 = 0$
 - B. $(x - 6)^2 = 0$
 - C. $(x + 6)^2 = 0$
 - D. $(x - 6)(x + 6) = 0$
13. If $f(x) = x^2 + 3x + 1$, what is $f(x + 2)$?
- A. $x^2 + 3x + 3$
 - B. $(x + 2)^2 + 3(x + 2) + 1$
 - C. $(x + 2)(x^2 + 3x + 1)$
 - D. $x^2 + 3x + 9$
14. What, if any, is a real solution to $\sqrt{5x + 1} + 9 = 3$?
- A. $-\frac{1}{5}$
 - B. 7
 - C. $\frac{143}{5}$
 - D. There is no real solution
15. If $x \neq -2$ and $x \neq -\frac{3}{2}$, what is the solution to $\frac{5}{x+2} = \frac{x}{2x-3}$?
- A. 3 and 5
 - B. 2 and $-\frac{3}{2}$
 - C. -2 and $\frac{3}{2}$
 - D. -3 and -5

16. Triangle JKL and triangle PQR are shown above. If $\angle J$ is congruent to $\angle P$, which of the following must be true in order to prove that triangles JKL and PQR are congruent?

- A. $\angle L \cong \angle R$ and $JL = PR$
- B. $KL = QR$ and $PR = JL$
- C. $JK = PQ$ and $KL = QR$
- D. $\angle K \cong \angle Q$ and $\angle L \cong \angle R$



17. In the function $f(x) = a(x + 2)(x - 3)^b$, a and b are both integer constants and b is positive. If the end behavior of the graph of $y = f(x)$ is positive for both very large negative values of x , and very large positive values of x , what is true about a and b ?

- A. a is negative, and b is even.
- B. a is positive, and b is even.
- C. a is negative, and b is odd.
- D. a is positive, and b is odd.

18. Which of the following equations is equivalent to $2^{5x} = 7$?

- A. $x = \log_2\left(\frac{7}{5}\right)$
- B. $x = \frac{\log_2 7}{5}$
- C. $x = \frac{\log_7 2}{5}$
- D. $x = \frac{\log_7 5}{2}$

19. If $x > 0$ and $y > 0$, which of the following expressions is equivalent to $\frac{x-y}{\sqrt{x}-\sqrt{y}}$?

A. $\frac{x-y}{\sqrt{x-y}}$

B. $\sqrt{x-y}$

C. $\sqrt{x} + \sqrt{y}$

D. $x\sqrt{x} + y\sqrt{y}$

20. In triangle ABC , angle C is a right angle. If $\cos A = \frac{5}{8}$ what is the value of $\cos B$?

A. $\frac{3}{8}$

B. $\frac{5}{8}$

C. $\frac{\sqrt{39}}{8}$

D. $\frac{\sqrt{89}}{8}$

Accuplacer Advanced Algebra and Functions Answer Key

1	2	3	4	5	6	7	8	9	10
D	A	D	B	A	C	B	B	D	A

11	12	13	14	15	16	17	18	19	20
C	B	B	D	A	A	D	B	C	C

Rationales

1. **Choice D is correct.** The value of $g(12)$ can be found by substituting 12 for x in the equation for $g(x)$. This yields $g(12) = 3(12 + 8)$, which is equivalent to $3(20)$ or 60. Choice A is incorrect. This answer represents the value of x in the equation $12 = 3(x + 8)$. Choice B is incorrect. This answer represents the value of the expression in parentheses. Choice C is incorrect. This answer is a result of incorrectly distributing the 3 through the expression in parentheses: $g(12) = 3(12) + 8$.

2. **Choice A is correct.** The slopes of perpendicular lines are negative reciprocals of each other. The slope of the line in the graph is $-\frac{4}{5}$. The negative reciprocal of $-\frac{4}{5}$ is $\frac{5}{4}$. A line that passes through the point $(0, 0)$ has a y -intercept of 0. Therefore, the equation $y = \frac{5}{4}x + 0$, or $y = \frac{5}{4}x$, is correct. Choice B is incorrect because it is an equation of a line that is perpendicular to the line shown, but it does not pass through the origin. Choice C is incorrect because this equation is parallel to the line shown, not perpendicular. Choice D is incorrect because it is the equation of the line shown in the graph.

3. **Choice D is correct.** The surface area of the rectangular prism is the total area of each of the faces of the prism and can be written as $2(\text{length} \times \text{width}) + 2(\text{height} \times \text{width}) + 2(\text{length} \times \text{height})$, which is $2(4 \text{ cm} \times 9 \text{ cm}) + 2(3 \text{ cm} \times 9 \text{ cm}) + 2(4 \text{ cm} \times 3 \text{ cm})$, or 150 cm^2 . Choice A is incorrect because it is half the surface area of the prism. Choice B is incorrect because it is the volume of the prism. Choice C is incorrect because it is 30 units less than the surface area of the prism described.

4. **Choice B is correct.** Using the distribution property, the given expression can be rewritten as $x(x^2) + x(-3x) + x(2) + 7(x^2) + 7(-3x) + 7(2)$. Further simplifying results in $x^3 - 3x^2 + 2x + 7x^2 - 21x + 14$. Finally, adding like terms yields $x^3 + 4x^2 - 19x + 14$. Choices A, C, and D are incorrect because they each result from errors made when performing the necessary distribution and adding like terms.

5. **Choice A is correct.** The cost per pound of apples can be determined by the slope of the graph as about \$1.33 per pound. The cost per pound of pears can be determined by the slope of the line defined by the equation $C = \frac{7}{5}p$. The slope of the line defined by C is $\frac{7}{5}$, so the cost per pound of pears is \$1.40. Therefore, the apples cost approximately \$0.07 less per pound than pears do. Choice B is incorrect. This is the result of misreading the cost per pound of apples as \$0.67 and the cost per pound of pears as \$0.71 and then finding the difference between the two values. Choice C is incorrect. This is the result of misreading the cost per pound of apples from the graph as \$0.67 and then subtracting the cost per pound of pears, \$1.40. Choice D is incorrect. This is the result of misreading the cost per pound of pears as \$0.71 and then subtracting this value from the cost per pound of apples, \$1.33.
6. **Choice C is correct.** A function has one output for each input. Each x -value on this graph corresponds to only one y -value. Choices A, B, and D are incorrect because each has x -values that correspond to more than one y -value.
7. **Choice B is correct.** The expression $3(x - 2)(x + 4)$ can be expanded by first multiplying $(x - 2)$ by 3 to get $(3x - 6)$ and then multiplying $(3x - 6)$ by $(x + 4)$ to get $3x^2 + 6x - 24$. Choice A is incorrect because it is equivalent to $3x^2 - 6x - 24$. Choice C is incorrect because it is equivalent to $x^2 - 6x - 72$. Choice D is incorrect because it is equivalent to $x^2 + 6x - 72$.
8. **Choice B is correct.** An exponential function can be written in the form $y = ab^t$ where a is the initial amount, b is the growth factor, and t is the time. In the scenario described, the variable y can be substituted with n , the total number of bacteria, and the initial amount is given as 500, which yields $n = 500b^t$. The growth factor is 2 because the population is described as being expected to double, which gives the equation $n = 500(2)^t$. The population is expected to double every 4 hours, so for the time to be x days, x must be multiplied by 6 (the number of 4-hour periods in 1 day). This gives the final equation $n = 500(2)^{6x}$. Choices A, C, and D are incorrect. Choice A does not account for the six 4-hour periods per day, choice C uses the number of time periods per day as the growth rate, and choice D uses the number of time periods per day as the growth rate and multiplies the exponent by the actual growth rate.
9. **Choice D is correct.** Subtracting 5 from both sides of the equation gives $x^2 + 5x - 14 = 0$. The left-hand side of the equation can be factored, giving $(x + 7)(x - 2) = 0$. Therefore, the solutions to the quadratic equation are $x = -7$ and $x = 2$. Choice A is incorrect because $7^2 + 5(7) - 9$ is not equal to 5. Choice B is incorrect because $3^2 + 5(3) - 9$ is not equal to 5. Choice C is incorrect because $(-2)^2 + 5(-2) - 9$ is not equal to 5.

10. Choice A is correct. The graph of $y = f(x)$ crosses the x -axis at $x = -2$ and $x = 4$, crosses the y -axis at $y = 8$, and has its vertex at the point $(1, -9)$. Therefore, the ordered pairs $(-2, 0)$, $(4, 0)$, $(0, -8)$, and $(1, -9)$ must satisfy the equation for $f(x)$. Furthermore, because the graph opens upward, the equation defining $f(x)$ must have a positive leading coefficient. All of these conditions are met by the equation $f(x) = x^2 - 2x - 8$. Choice B is incorrect. The points $(-2, 0)$, $(4, 0)$, $(0, -8)$, and $(1, -9)$, which are easily identified on the graph of $y = f(x)$, do not all satisfy the equation $f(x) = -x^2 + 2x - 8$; only $(0, -8)$ does. Therefore $f(x) = -x^2 + 2x - 8$ cannot define the function graphed. Furthermore, because the graph opens upward, the equation defining $y = f(x)$ must have a positive leading coefficient, which $f(x) = -x^2 + 2x - 8$ does not. Choice C is incorrect. The points $(-2, 0)$, $(4, 0)$, $(0, -8)$, and $(1, -9)$, which are easily identified on the graph of $y = f(x)$, do not all satisfy the equation $f(x) = (x - 2)(x + 4)$; only $(0, -8)$ does. Therefore, $f(x) = (x - 2)(x + 4)$ cannot define the function graphed. Choice D is incorrect. Though the vertex $(1, -9)$ does satisfy the equation $f(x) = -(x - 1)^2 - 9$, the points $(-2, 0)$, $(4, 0)$, and $(0, -8)$ do not. Therefore, $f(x) = -(x - 1)^2 - 9$ cannot define the function graphed. Furthermore, because the graph opens upward, the equation defining $y = f(x)$ must have a positive leading coefficient, which $f(x) = -(x - 1)^2 - 9$ does not.

11. Choice C is correct. The range of a function describes the set of all outputs, y , that satisfy the equation defining the function. In the xy -plane, the graph of $y = -2x^4 + 7$ is a U-shaped graph that opens downward with its vertex at $(0, 7)$. Because the graph opens downward, the vertex indicates that the maximum value of y is 7. Therefore, the range of the function defined by $y = -2x^4 + 7$ is the set of y -values less than or equal to 7. Choices A, B, and D are incorrect in that choice A doesn't cover the entire range, while choices B and D include values that aren't part of the range.

12. Choice B is correct. The only value of x that satisfies the equation $(x - 6)^2 = 0$ is 6. Choice A is incorrect because $x = 0$ is the only solution to the equation $(6x)^2 = 0$. Choice C is incorrect because $x = -6$ is the only solution to the equation $(x + 6)^2 = 0$. Choice D is incorrect because although $x = 6$ is a solution to the equation $(x - 6)(x + 6) = 0$, $x = -6$ is another solution to the equation.

13. Choice B is correct. Substituting $x + 2$ for x in the original function gives $f(x + 2) = (x + 2)^2 + 3(x + 2) + 1$. Choice A is incorrect. This is $f(x) + 2$. Choice C is incorrect. This is $(x + 2)f(x)$. Choice D is incorrect. This is $f(x) + 2^3$.

- 14. Choice D is correct.** Subtracting 9 from both sides of the equation yields $5x + 1 = -6$, and there are no real values of x that result in the square root of a number being negative, so the equation has no real solution. Choices A and C are incorrect due to computational errors in solving for x and not checking the solution in the original equation. Choice B is incorrect because it is the extraneous solution to the equation.
- 15. Choice A is correct.** To solve the equation for x , cross multiply to yield $x(x + 2) = 5(2x - 3)$. Simplifying both sides of the new equation results in $x^2 + 2x = 10x - 15$. Next, subtract $10x$ from both sides of the equation and add 15 to both sides of the equation to yield $x^2 - 8x + 15 = 0$. By factoring the left-hand side, the equation can be rewritten in the form $(x - 3)(x - 5) = 0$. It follows, therefore, that $x = 3$ and $x = 5$. Choices B, C, and D are possible results from mathematical errors when solving the equation for x .
- 16. Choice A is correct.** If two angles and the included side of one triangle are congruent to corresponding parts of another triangle, the triangles are congruent. Since angles J and L are congruent to angles P and R , respectively, and the side lengths between each pair of angles, JL and PR , are also equal, then it can be proven that triangles JKL and PQR are congruent. Choices B and C are incorrect because only when two sides and the included angle of one triangle are congruent to corresponding parts of another triangle can the triangles be proven to be congruent, and angles J and P are not included within the corresponding pairs of sides given. Further, side-side-angle congruence works only for right triangles, and it is not given that triangles JKL and PQR are right triangles. Choice D is incorrect because the triangles can only be proven to be similar (not congruent) if all three sets of corresponding angles are congruent.
- 17. Choice D is correct.** A polynomial function of even degree with a positive leading coefficient will have positive end behavior for both very large negative values of x and very large positive values of x . For a polynomial function in the form $f(x) = a(x + 2)(x - 3)^b$ to be of even degree with a positive leading coefficient, a must be positive and b must be odd. Choice A is incorrect. If a is negative and b is even, the polynomial function will be of odd degree, with a negative leading coefficient. This results in positive end behavior for very large negative values of x and negative end behavior for very large positive values of x . Choice B is incorrect. If a is positive and b is even, the polynomial function will be of odd degree with a positive leading coefficient. This results in negative end behavior for very large negative values of x and positive end behavior for very large positive values of x . Choice C is incorrect. If a is negative and b is odd, the polynomial function will be of even degree with a negative leading coefficient. This results in negative end behavior on both sides of the function.

18. Choice B is correct. By definition, if $(b)^x = y$, where $b > 0$ and $b \neq 1$, then $x = \log_b y$.

Therefore, the given equation $2^{5x} = 7$ can be rewritten in the form $\log_2 7 = 5x$. Next, solving for x by dividing both sides of the equation by 5 yields $\frac{\log_2 7}{5} = x$. Choices A, C, and D are incorrect because they are the result of misapplying the identity, which states that if $(b)^x = y$, where $b > 0$ and $b \neq 1$, then $x = \log_b y$.

19. Choice C is correct. Since $x > 0$ and $y > 0$, x can be rewritten as $(\sqrt{x})^2$ and y can be rewritten as $(\sqrt{y})^2$. It follows, then, that $\frac{x-y}{\sqrt{x}-\sqrt{y}}$ can be rewritten as $\frac{(\sqrt{x})^2 - (\sqrt{y})^2}{\sqrt{x}-\sqrt{y}}$. Because the numerator is a difference of two squares, it can be factored as $\frac{(\sqrt{x} + \sqrt{y})(\sqrt{x} - \sqrt{y})}{\sqrt{x} - \sqrt{y}}$. Finally, dividing the common factors of $(\sqrt{x} - \sqrt{y})$ in the numerator and denominator yields $\sqrt{x} + \sqrt{y}$. Alternatively, if $\frac{x-y}{\sqrt{x}-\sqrt{y}}$ is multiplied by $\frac{\sqrt{x} + \sqrt{y}}{\sqrt{x} + \sqrt{y}}$, which is equal to 1, and therefore does not change the value of the original expression, the result is $\frac{(x-y)(\sqrt{x} + \sqrt{y})}{(\sqrt{x}-\sqrt{y})(\sqrt{x} + \sqrt{y})}$, which is equivalent to $\frac{x\sqrt{x} + x\sqrt{y} - y\sqrt{x} - y\sqrt{y}}{x - \sqrt{xy} + \sqrt{xy} - y}$. This can be rewritten as $\frac{(x-y)(\sqrt{x} + \sqrt{y})}{(x-y)}$, which can be simplified to $\sqrt{x} + \sqrt{y}$. Choice A is incorrect and may be the result of incorrectly combining $\sqrt{x} - \sqrt{y}$. Choice B is incorrect because it is equivalent to $\frac{x-y}{\sqrt{x}-\sqrt{y}}$. Choice D is incorrect and may be the result of misusing the conjugate strategy. Instead of multiplying the numerator and denominator by the quantity $(\sqrt{x} + \sqrt{y})$, they may have been multiplied by $(\sqrt{x} - \sqrt{y})$ and then improperly distributed.

20. Choice C is correct. If triangle ABC is defined as a right triangle, where angle C is the right angle, then the cosine of angle A ($\cos A$) is defined as the ratio $\frac{\text{the length of the side adjacent to angle A}}{\text{the length of the hypotenuse}}$. Since this ratio is defined as $\frac{5}{8}$, then the length of the side opposite angle A , which is also the side adjacent to angle B , can be derived from the Pythagorean theorem: $a^2 + 5^2 = 8^2$, where a represents the length of the side opposite angle A . Solving for a yields $a^2 = 64 - 25 = 39$, so $a = \sqrt{39}$. Then, to determine the cosine of angle B , use the same ratio in relation to angle B : $\cos B = \frac{\text{the length of the side adjacent to angle B}}{\text{the length of the hypotenuse}} = \frac{\sqrt{39}}{8}$. Choice A and D are incorrect and likely results from an error in finding the length of side \overline{CB} . Choice B is incorrect and is the value of $\cos A$ and $\sin B$.

Calculus Readiness Practice Test

Calculators not allowed

Function Questions

1. If $f(m) = m^3 - 2m^2 + m$, then $f(-2) =$
 - a) -2
 - b) 14
 - c) -16
 - d) -18
 - e) None of these

2. If $r(t) = 2t^2 - 7t - 4$, then $r(-1) =$
 - a) 5
 - b) -13
 - c) -9
 - d) -5
 - e) None of these

3. If $f(x) = 2x + 3$ and $g(x) = \frac{x}{x-1}$, then $g(f(2)) =$
 - a) 7
 - b) $\frac{3}{4}$
 - c) $\frac{4}{3}$
 - d) $\frac{5}{4}$
 - e) $\frac{7}{6}$

4. If $f(x) = \frac{x+1}{x}$ and $g(x) = x^2 + 1$, then $g(f(1)) =$
- a) $\frac{3}{2}$
 - b) $\frac{2}{3}$
 - c) 5
 - d) 2
 - e) None of these
5. Let $f(x) = \sqrt{2x-3}$. The domain (set of inputs) of the function f is the set of all numbers x such that
- a) $x \geq 0$
 - b) $x > 2$
 - c) $x \geq \frac{3}{2}$
 - d) $x \geq \frac{2}{3}$
 - e) None of these
6. Let $f(x) = \frac{1}{\sqrt{3-x}}$. The domain (set of inputs) of the functions is the set of all numbers x such that
- a) $x > 3$
 - b) $x > 0$
 - c) $x \leq -3$
 - d) $x < -3$
 - e) $x < 3$

Logarithms Questions

7. For $x > 0$, $\log(10x(x+1)) =$

- a) $10\log(x)\log(x+1)$
- b) $1 + \log(x) + \log(x+1)$
- c) $\log(10x) - \log(x+1)$
- d) $10 - \log(x) - \log(x+1)$
- e) None of these

8. For $t > 0$, $\log\left(\frac{(t+1)^2}{t}\right) =$

- a) $\frac{\log(t+1)^2}{\log(t)}$
- b) $\frac{2\log(t+1)}{\log(t)}$
- c) $\log\left(\frac{1}{3}\right)$
- d) $2\log(t+1) + \log(t)$
- e) $2\log(t+1) - \log(t)$

9. If $x = \log_3 50$, then x is a number such that

- a) $1 < x < 2$
- b) $2 < x < 3$
- c) $3 < x < 4$
- d) $4 < x < 5$
- e) $x > 5$

10. If $\log_2 a = 2.1$ and $\log_2 b = 1.5$, then $\log_2 \frac{2a}{b} =$
- a) can't be determined from the given information
 - b) 0.6
 - c) 2.6
 - d) 1.6
 - e) 3.6

11. If $\log_2(3x-5) = 3$, then $x =$
- a) $\frac{8}{3}$
 - b) $\frac{2}{3}$
 - c) $\frac{1}{3}$
 - d) $\frac{14}{3}$
 - e) $\frac{13}{3}$

12. If $\log_3(2x-1) = 2$, then $x =$
- a) 5
 - b) $\frac{3}{2}$
 - c) $\frac{7}{2}$
 - d) 3
 - e) $\frac{1}{2}$

Trigonometry Questions

13. In the figure here (not drawn to scale), what is the value of $\tan A$?

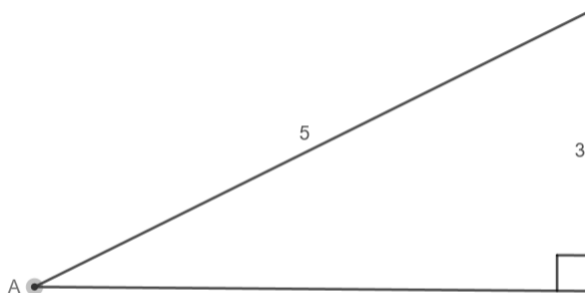
a) $\frac{3}{5}$

b) $\frac{4}{5}$

c) $\frac{5}{3}$

d) $\frac{5}{4}$

e) $\frac{3}{4}$



14. If θ is an acute angle with $\sin \theta = \frac{2}{3}$, what is the value of $\cos \theta$?

a) $\frac{1}{3}$

b) $\frac{5}{3}$

c) $\frac{\sqrt{7}}{3}$

d) $\frac{\sqrt{5}}{3}$

e) $\frac{\sqrt{2}}{3}$

15. What is the value of $\sin\left(\frac{\pi}{2}\right) + \cos(\pi)$?

a) -1

b) 0

c) 1

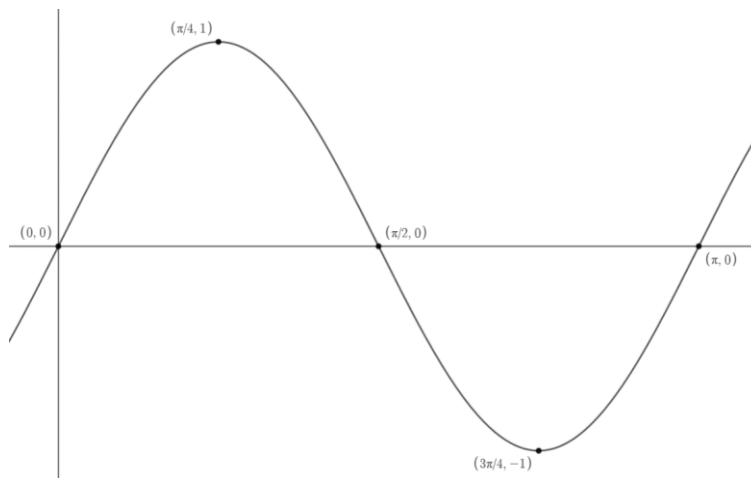
d) 2

e) cannot be determined without a calculator

16. What is the value of $\sin^2(2) + \cos^2(2)$?
- a) 4
 - b) 0
 - c) 1
 - d) $\frac{\sqrt{2}}{2}$
 - e) None of these
17. If $\sin(x) = \frac{1}{2}$ with $0 < x < \frac{\pi}{2}$, then $\cos(2x) =$
- a) $\frac{\sqrt{3}}{2}$
 - b) 0
 - c) $\frac{1}{2}$
 - d) 1
 - e) None of these
18. If $\sin(x) = \frac{\sqrt{2}}{2}$ with $0 < x < \frac{\pi}{2}$, what is the value of $\tan(x)$?
- a) $\sqrt{3}$
 - b) $\frac{1}{\sqrt{3}}$
 - c) 1
 - d) $\frac{2}{\sqrt{2}}$
 - e) None of these

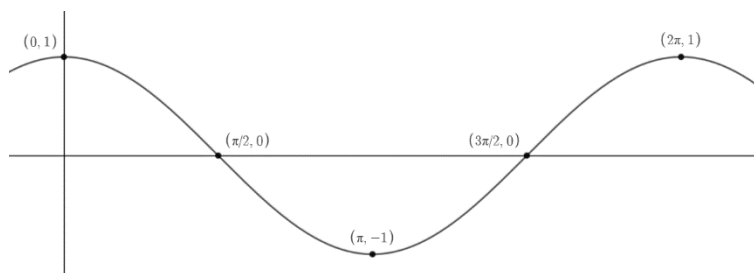
19. The curve shown here could be a portion of the graph of $y =$

- a) $\sin(x)$
- b) $\cos(x)$
- c) $-\sin(x)$
- d) $\cos(2x)$
- e) $\sin(2x)$



20. The curve above could be a portion of the graph of $y =$

- a) $\cos x$
- b) $\sin x$
- c) $-\cos x$
- d) $-\sin x$
- e) none of these



Accuplacer Calculus Readiness Answer Key

1	2	3	4	5	6	7	8	9	10
D	A	E	C	C	E	B	E	C	D

11	12	13	14	15	16	17	18	19	20
E	A	E	D	B	C	C	C	E	A