K-16 Education Center
Continuing & Innovative Education

Geometry A

Credit By Exam Study Guide

This Credit By Exam Study Guide can help you prepare for the exam by giving you an idea of what you need to study, review, and learn. To succeed, you should be thoroughly familiar with the subject matter before you attempt to take the exam.

Every question that appears on the Credit by Exam/Examination for Acceleration is grounded in the knowledge and skills statements and student expectations within the state-mandated standards, the Texas Essential Knowledge and Skills (TEKS). It should be noted that an exam will not test every student expectation. However, it is important that students study and know the entire scope of the TEKS so that they can develop a complete understanding of the content. The CBE/EAs are a global exam grounded in the TEKS and are not designed to be a final exam for the University of Texas high school courses. You can view the TEKS for this exam online at http://www.tea.state.tx.us/teks/. Since questions are not taken from any one source, you can prepare by reviewing any of the state-adopted textbooks.

About the exam

The Credit By Exam consists of 50 multiple-choice questions that are worth 2 points each. You will be allowed **3 hours** to take the exam and you will be allowed to use a **graphing calculator**. You will also be provided the Formula Sheet found in this Study Guide.

Materials Provided

For paper-based exams, a formula sheet will be provided with your test. For computer-based exams, the proctor will provide to you a paper copy of the formula sheet immediately prior to testing. You will return the sheet after the exam. An example of the formula sheet follows.

Formula Sheet

Perimeter: $P = 2l + 2w$ or $P = 2(l + w)$

Circumference: $C = 2\pi r$ or $C = \pi d$

Pythagorean Theorem: $a^2 + b^2 = c^2$

Pi (π) ≈ 3.14 or $\approx \dfrac{22}{7}$

Distance Formula: $d = \sqrt{(x_2 - x_1)^2 + (y_2 - y_1)^2}$

Slope of a line: $m = \left(\dfrac{y_2 - y_1}{x_2 - x_1}\right)$

Midpoint Formula: $\left(\dfrac{x_1 + x_2}{2}, \dfrac{y_1 + y_2}{2}\right)$

Quadratic Formula: $x = \dfrac{-b \pm \sqrt{b^2 - 4ac}}{2a}$

Standard Form of an Equation: $Ax + By$

Point-Slope Form of an Equation: $y - y_1 = m(x - x_1)$

Simple Interest Formula: $I = prt$

Slope-Intercept Form of an Equation: $y = mx + b$

Special Circle Angles

When the vertex of an angle is outside of the circle, the measure of the angle formed is half of the difference of the intercepted arcs
Vertical angles and their intercepted arcs: half of the sum of the arc measures is the measure of the angle

Area	Surface Area
Rectangle: $A = lw$ or $A = bh$	Cube: $SA = 6s^2$
Triangle: $A = \dfrac{1}{2}bh$	Cylinder (lateral): $SA = 2\pi rh$
Trapezoid: $A = \dfrac{1}{2}(b_1 + b_2)h$	Cylinder (total): $SA = 2\pi rh + 2\pi r^2$ or $SA = 2\pi r(h + r)$
Regular Polygon: $A = \dfrac{1}{2}aP$	Cone (lateral): $SA = \pi rl$
Circle: $A = \pi r^2$	Cone (total): $SA = \pi rl + \pi r^2$ or $SA = \pi(l + r)$
Sector of a Circle: $A = \dfrac{m\ of\ arc}{360°} \bullet \pi r^2$	Sphere: $SA = 4\pi r^2$

Volume	Trigonometry (Right Triangles)
Prism or cylinder: $V = Bh$	$\sin(\angle B) = \dfrac{\text{opposite side}}{\text{hypotenuse}}$
Pyramid or cone: $V = \dfrac{1}{3}Bh$	$\cos(\angle B) = \dfrac{\text{adjacent side}}{\text{hypotenuse}}$
Sphere: $V = \dfrac{4}{3}\pi r^3$	$\tan(\angle B) = \dfrac{\text{opposite side}}{\text{adjacent side}}$

Concepts and Objectives

The bulleted list and sample questions below may not refer to all the material that will be in the exam. This list only provides additional information for some of the student expectations tested in the Geometry First Semester Credit by Exam. Ultimately, you should use the TEKS to guide your exam preparation.

The first semester of Geometry focuses on an introduction to points, lines, planes, segments, distances, angles and measures, perpendicular bisectors, and points of concurrency in triangles. The first semester also introduces proofs and geometric systems, translations, reflections, rotations, symmetry, proving congruent angles, proving parallel lines, understanding the relationship between slopes of parallel and perpendicular lines, composition of isometries, and tessellations triangles, including the classification and parts of triangles, definitions of isosceles and equilateral triangles, special segments in a triangle, proving triangles congruent, and constructions.

For the exam, you should be able to
- identify and apply postulates relating points, planes, line segments, and angle measures;
- use equal signs and equivalency signs properly;
- apply what you know about complementary and supplementary angles to solve problems;
- identify geometric shapes in real-world scenarios, including different kinds of triangles, inscribed or circumscribed objects, bisectors, midpoints, circumcenters, and incenters;
- find the distance between two points on a coordinate system;
- translate, rotate, and reflect objects on a coordinate system given the vertices of the original object;
- identify alternate interior, alternate exterior, corresponding, vertical, and supplementary angles given two sets of parallel lines;
- use the definitions of alternate interior, alternate exterior, corresponding, vertical, supplementary, and complementary angles to calculate angle measures;
- use what you know about the slopes of parallel and perpendicular lines to determine whether or not two line segments are parallel or perpendicular or neither;
- write an equation of a line that passes through a particular point and is parallel or perpendicular to another given line;
- determine the perpendicular bisector of a line segment given the end points of the line segment;
- identify images or objects that will tessellate a plane or about a point;
- identify the isometry used in particular demonstrations (rotation, reflection, or translation);
- define and identify a glide reflection;
- apply the definitions of angle bisector and midsegment to given triangles;
- identify scalene, isosceles, equilateral, right, actue, and obtuse triangles;
- identify obtuse and acute angles for a given triangle;
- use the following postulates to prove the congruency of two triangles: SSS, SAS, ASA, AAS, HL, CPCTC;
- given a construction, identify congruent parts of the object constructed;
- complete two column proofs;

- explain geometry using Taxicab geometry;
- write an equation of a line that passes through two given points;
- find the measure of each interior angle and each exterior angle of a regular polygon with *n* sides;
- use the Pythagorean Theorem and the Triangle Inequality Theorem to solve problems;
- determine the validity of a conditional statement, its converse, inverse, and contrapositive;
- write an equation of a circle given its center and radius;
- use the Remote Interior Angle Theorem and the Triangle Sum Theorem to calculate angle measures;
- use the definition of a parallelogram to solve problems;
- construct special segments in triangles like angle bisectors, perpendicular bisectors, medians, and altitudes; and,
- find orthocenters, incenters, centroids, circumcenters, and the Euler line.

Sample Questions

These sample questions will give you a better idea of the types of questions you can expect on the Credit By Exam. These questions are provided to illustrate the format of the exam; they are not a duplicate of the actual exam. In order to be successful on the exam, you must study and review all of the concepts listed above.

Multiple-Choice

This part of the sample exam contains 5 multiple-choice questions. Circle the letter of the correct response to each of the following questions.

1. Determine the equation of a line that passes through (2, 7) and (4, 5).

    A $y = x + 9$
    B $y = -x + 9$
    C $y = x + 3$
    D $y = -x + 3$

2. Given ΔDEF with $D(3, 4)$, $E(1, 2)$, and $F(5, 0)$, find the equation that contains the perpendicular bisector of $\overline{EF}$.

    A $y = x - 2$
    B $y = 2x - 5$
    C $y = 3x - 8$
    D $y = -x + 2.5$

3. What is true for three non-collinear points?

    A They form an obtuse triangle.
    B They form a right triangle.

C   They form an acute triangle.
D   They define a unique plane.

4. Solve for x in the diagram.
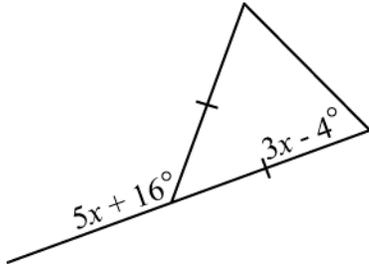
A 15°
B 18°
C 21°
D 24°

5. Which of the following postulates is not used to prove congruence?

A ASA
B SAS
C SSA
D AAS

Answer Key

Item Number	Correct Answer
1	B
2	B
3	D
4	D
5	C