

Algebra I Honors  
CEOCE Study Guide

**A141 Compares Real Numbers (MC)**

Draw a number line and mark the following points:  $\sqrt{7}$        $2.3^2$        $\frac{24}{4}$        $\sqrt{26}$

**A144 Expresses Radicals in Standard Notation/Simplest Form(MC)**

Express in scientific notation:      0.0025      0.000056      1,450,000      17,000,000

Express in standard form:       $3.2 \times 10^3$        $2.25 \times 10^7$        $9.01 \times 10^{-3}$        $5.85 \times 10^{-6}$

Simplify:       $\sqrt{27}$        $3\sqrt{128}$        $5\sqrt{3} + \sqrt{12}$        $\sqrt{121} + \sqrt{196}$

**A342 Uses Rules of Order of Operations(MC)**

Evaluate the expressions:       $3[10 \div 2 \bullet 3 + 6^2]$        $5^2 - (3^3 - 3 \bullet 3)$

Simplify the expressions:       $4 + 3(2 + x)$        $5(x - 1) + 3 + 2(x + 2)$

**A343 Factors Difference of Perfect Squares/Perfect Square Trinomials(MC)**

Adds, Subtracts, Multiplies & Divides with Monomials and Polynomials

Uses Binomial Multiplication

Solves Trinomials Factored by Monomials

Solves Trinomials Factored by Binomials

Simplifies Exponential Expressions

A rectangular box has a length of  $4x$ , a width of  $3x$  and a height of  $2x + 2$ . Evaluate the surface area of this figure.

Evaluate the expressions:  $(5x + 4)^2$

$$(a^{-2}b^2c^3)^{-3}$$

Factor completely:  $(9y^2 - 16)$

$$2x^2 - 5x - 12$$

$$x^2 + 7x + 10$$

$$9(x + 2) - x(x + 2)$$

Find the greatest common monomial factor of the following expression:  $8ab + 16a^2b^3 + 4a^3b^2$

Simplify:

$$\frac{5.4 \times 10^7}{2 \times 10^5}$$

$$\left( \frac{21a^2b^{-5}c^3}{3a^{-1}b^3c^2} \right)^3$$

$$3x^2y(4x^2 - 2xy^2 + 3y)$$

$$(2m^2n + 3mn - 8n^3) - (5m^2n^2 - 7mn^2 + 4mn - 3n^3)$$

$$(2x - 5)(x - 6) + (3x - 2)(x + 3)$$

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B141 Represents Perimeter / Area / Volume / in Polynomial Form(MC)

The length of a rectangle is represented by  $3a + 2$ . The width is equivalent to  $2a + 5$ . What expression represents the area of the rectangle?

The area of a rectangular horse pasture is known to be 10,000 square feet. The width of the pasture is 25 feet shorter than the length. Write an equation that could be used to calculate the length and width of the horse pasture.

B143 Solves Problems Using Ratios & Proportions(MC)

Mr. Cameron's drafting class uses scale drawings to draw pictures of large buildings. The scale his class uses is 1 inch on the drawing = 2.5 feet on the building. The length of the auditorium is 125 feet. How many inches should the length be in their drawing?

The lengths of the 3 sides of a triangle can be represented by the ratio 3:4:5. If the shortest side has a length of 12 centimeters, what is the length of the longest side?

If Tyson travels 120 miles in 2 hours, how many hours will it take him to travel 330 miles?

B241 Uses Pythagorean Theorem (MC)

A right triangle is plotted with vertices at  $(1, 1)$ ,  $(6, 1)$  and  $(1, 13)$ . What is the length of the hypotenuse?

Mrs. Collins has a 10 foot ladder she lays against a building such that the top of the ladder rests at the top of the building. The building is 8 feet high. How far away from the building is the base of the ladder?

A 40 ft antenna sits on top of a 200 ft hill. The distance from the top of the antenna to an observer on the ground is 300 ft. How far is the observer from the base of the hill?

B242 Uses Motion Formulas (distance, rate, time) (MC)

Mr. Dudley travels from Ocala to Atlanta at a rate of 70 miles per hour. If the distance from Ocala to Atlanta is 350 miles, use the distance formula to represent the time  $t$  it will take to reach his destination.

A flight from Orlando to Los Angeles averages 450 miles per hour. Use the distance formula to determine how far the plane will have traveled after 2.5 hours.

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C342 Writes Equation from 2 Points / Graph / Slope - Intercept(MC)  
Uses Distance Formula  
Finds Slope from 2 Points, Graph, Equation  
Plots / Interprets Points on Coordinate System  
Graphs Line Using Slope -Intercept and x / y Intercept  
Writes Equation for  $\perp$  &  $//$  Lines

What is the slope and y-intercept of the following function?  $y = 3x - 6$

Find the distance and midpoint between the points  $(-4, 2)$  and  $(4, 17)$ .

Find the equation of the line that passes through points  $(0, 3)$  and  $(2, -1)$ .

Find the equation of the line parallel to the equation that passes through the points  $(4, 9)$  and  $(-3, -8)$ .

What is the slope of the equation  $x = 4$ ?

What is the slope of the equation  $y = 4$ ?

What is the endpoint of the line segment whose midpoint is  $(0, 0)$  and begins at  $(-7, 3)$ ?

In which quadrant is the point  $(0, -3)$  located?

D141 Uses Patterns (Geometric & Numeric) (MC, GR)  
Writes Equations from a Relation  
Evaluates Function Notation

Write an equation for the data in this table

x	y
0	3
-3	1
-6	-1
3	5

For the function  $f(x) = 2x^2 - 5$ , find  $f(-7)$  and  $f(6)$ .

Draw a mapping diagram for the following ordered pairs:

$(3, -7), (2, 5), (6, -7), (8, 2), (2, 3)$ .

Is this relation a function?

Find the next four terms in these sequences...

a)  $-31, -22, -13, -4, \dots$

b)  $1, 4, 9, 16, \dots$

c)  $0, 2, 5, 9, 14, 20, \dots$

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Given  $f(x) = 2x^2 + 3x - 5$ , find

- a)  $f(3) - f(2)$
- b)  $f(-3) \cdot f(4)$
- c)  $f(5) \div f(-2)$
- d)  $f(4) + f(-6)$

D142 Interprets Slopes & Intercepts (MC, GR, ER)  
Parameter Change  $\perp$  on Slope, y-int

Name both the x-intercept and y-intercept of the following function:  $\frac{1}{3}x + 5y = 13$

In the equation  $5x - 7y = 13$ , define the slope, x-intercept and y-intercept.

What happens to the slope of the equation  $y = 3x + 5$  if the x-coefficient is changed to a negative?  
What if the y-coefficient is changed to a negative?

Find the slope-intercept form of a line that passes through the points (2, 5) and (6, -7).

D241 Writes Algebraic Expression from Verbal Expression (MC, GR)  
Evaluates Variable Expressions / Equations

Write and solve an equation to meet the following criteria: Three less than twice a number is four more than the quotient of the number and five.

Marcia wants to spend at most \$175 for school clothes. If she has bought a coat for \$75 and jeans for \$38, write an inequality to describe how much she has left to spend on shoes.

If  $x + 9 = -\frac{2}{3}$ , what is  $5x$  equal to?

D242 Solves Equations / Inequalities Using the Distributive Property (MC, SR)  
Solves Equations / Inequalities by Combining Like Terms  
Solves Problems by Direct Translation to an Equation  
Solves Quadratics by Factoring  
Solves Quadratics by Quadratic Formula  
Solves Systems of Equations

Solve the following equations:

- a)  $3x - 2(5x - 7) = 4(3x - 2) - 5(x - 9)$
- b)  $\frac{1}{2}x + 7 = 5(2x - 9)$

Solve the following inequalities:

- a)  $3a > -5a + 16$
- b)  $3(2c + 5) \leq 7(8c - 5)$

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Solve the system of equations:

$$3x - 2y = 13$$

$$5x + 7y = 22$$

The sum of two numbers is 147. The second number is three more than the first. Find each of these two numbers.

Tickets to the championship basketball game cost \$25 for adults and \$15 for children. A total of 800 people attended the game and the total ticket sales were \$17,000. How many adults attended the game?

Last month Darlene earned \$32 per day and Lisa earned \$36 per day. Together they earned a total of \$1,180. How much did each earn if Darlene worked 5 more days than Lisa?

A plumber gives homeowners a choice of paying a fee of \$135 plus \$15 per hour (Plan A) or a flat \$35 per hour (Plan B).

$$\text{Plan A} = \$135 + 15h$$

$$\text{Plan B} = \$35h$$

After how many hours does Plan A become more economical for a homeowner?

### Key Vocabulary

Binomial

trinomial

Polynomial

Monomial

Algebraic expression

### Web resources

[http://www.glencoe.com/sec/math/algebra/algebra1/algebra1\\_05/index.php4/fl](http://www.glencoe.com/sec/math/algebra/algebra1/algebra1_05/index.php4/fl)

<http://www.algebra.com/>

<http://www.algebrahelp.com/>

<http://www.purplemath.com/modules/index.htm>