Algebra I
CEOCE Study Guide

A141   Compares Real Numbers (MC)

Express in scientific notation: 0.000023   0.00000586   12,300,000   3,400,000

Express in standard form: $4.5x10^5$ $2.65x10^{-4}$ $3.274x10^{-7}$ $8.2x10^3$

A144   Expresses Radicals in Standard Notation (MC)

Simplify: $4\sqrt{2} + \sqrt{32}$ $2\sqrt{50}$ $3\sqrt{3} + 2\sqrt{50} - \sqrt{48}$

$-8\sqrt{8} + 3\sqrt{200}$ $\sqrt{45}$ $-6\sqrt{25} + \sqrt{54} - \sqrt{44}$

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)

If a = 12 and b = -6, evaluate the following expressions: 3a – 2b   -4a + 6b

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A343   Factors Perfect Squares/Difference of Perfect Squares (MC)
        Adds, Subtracts, Multiplies & Divides 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). Express the surface area of this figure in simplified form.

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: $\dfrac{5.4x10^7}{2x10^5}$ $\left(\dfrac{21a^2b^{-5}c^3}{3a^{-1}b^3c^2}\right)^3$

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

A541	Solves Problems Using Real Numbers and Patterns (MC)

A SCUBA diver dives to a depth of 400 ft below sea level. He ascends to the surface at a rate of 20 feet per minute. How long will it take the diver to reach a depth of 200 feet below sea level?

Caroline descends a mountain trail at a rate of 2 miles per hour. She starts her day 9 miles from her destination. How long will it take her to reach her destination?

B143	Solves Problems Involving Scale Models/Drawing (MC, GR)
	Solves Problems Using Ratios & Proportions

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 pole. 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 pole?

B242	Uses Motion Formulas (MC, GR)

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.

| C241 | Applies Geometric Concepts ($\perp$, //, etc.) (ER) |

Two lines are plotted on a coordinate plane. Line A runs through the points (4, 5) and (3, 2). Line B is drawn through (6, 8) and (3, 9). Determine if these two lines are parallel, perpendicular or neither.

C342	Writes Equation from Points/Graph/Slope-Intercept (MC,GR)
	Uses Distance Formula
	Finds Slope from 2 points, graph, $y = mx + b$, etc.
	Plots points/Interprets Information from Coordinate Graph
	Finds midpoint

What is the slope and y-intercept of the following formula? 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 whose midpoint is (0, 0) and begins at (-7, 3)?

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

D141	Identifies Relationship/Creates Functions (MC, GR)
	Finds nth term/Number of pictorial sequence
	Writes linear equation 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 or patterns…
a) -31, -22, -13, -4, …
b) 1, 4, 9, 16, …
c) 0, 2, 5, 9, 14, 20, …
d) Δ, □, △, …

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) $f(4) + f(-6)$

D241   Writes Algebraic expression from verbal expression (MC)

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

D242   Solves 2-step equations/inequalities   (MC, GR, SR)
Solves problems by direct translation to an equation
Solves literal equations
Solves system of equations
Solves real world problems using systems of equations

Solve the following equations:
   a) $3x - 2(5x - 7) = 4(3x - 2) - 5(x - 9)$
   b) $\dfrac{1}{2}x + 7 = 5(2x - 9)$

Solve the following inequalities:
   a) $3a > -5a + 16$
   b) $3(2c + 5) \le 7(8c - 5)$

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).

       Plan A = $135 + 15$h$

       Plan B = 35h$

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

Key Vocabulary

Binomial
Trinomial
Polynomial
Monomial
Algebraic expression
Greatest Common Factor
Function

Web resources

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