West Los Angeles College
SLO Addendum

Course Name and Number   MATH 117

Course Title   BASIC ELEMENTARY ALGEBRA I

Course Objectives (as stated in the Course Outline of Record)

1. a. Identify the opposite and the absolute value of any rational number
    b. Compare rational numbers using inequality notation
    c. Perform arithmetic operations with rational numbers
    d. Convert among percents, fractions, and decimals
    e. Evaluate numerical expressions using order of operations
    f. Identify sets and subsets of the real numbers.
    g. Identify and use the properties of the real numbers
    h. Construct and use number lines
    i. Apply the properties of the base-10 system

2. a. Evaluate variable expressions
    b. Identify like and unlike terms
    c. Simplify variable expressions using properties of addition and multiplication
    and the distributive property
    d. Translate a verbal expression into a variable expression, including applications
    e. Use formulas to solve problems
    f. Solve a literal equation for one of its variables

3. a. Determine whether a given number is a solution to an equation
    b. Solve general linear equations
    c. Solve equations involving rates, ratios, and percents
    d. Model and solve application problems using linear equations, including but not
    limited to:
        i. Uniform motion problems
        ii. Business applications
        iii. Value and Percent mixture problems
        iv. Geometry problems
        v. Non-routine applications

4. a. Construct a Cartesian coordinate system; identify and graph points
    b. Construct and interpret scatter diagrams

c. Determine solutions of linear equations in two variables

d. Graph linear equations in two variables given in standard or in function form

e. Find the slope of a straight line, given two points on the line or an equation of the line

f. Find an average rate of change and interpret slope as a rate of change

g. Graph a line given two points or one point and the slope

h. Find an equation for a line given two points or one point and the slope

i. Identify whether or not a relation is a function

j. Model applications using linear functions

k. Solve problems using linear functions

5. a. Solve general linear inequalities in one variable

b. Graph solutions to linear inequalities on a number line

c. Graph linear inequalities in two variables.

d. Model and solve application problems using linear inequalities in two variables

e. Solve simple problems in linear programming

6. a. Solve systems of linear equations by graphing

b. Solve systems of linear equations using algebraic methods

c. Model and solve application problems using systems of two equations in two variables (including but not limited to rate-of-wind and water-current problems)

d. Solve problems involving systems of linear functions

Math Program SLOs

1. Apply quantitative thinking processes using basic mathematical operations (addition, subtraction, multiplication, division) to solve common academic, workplace, and family problems.   (Theme: Quantitative thinking; mathematical operations)

2. Analyze and interpret spatial and graphic data (schedules, maps, tables, graphs, and geometric figures). (Theme: spatial and graphic data).

3. Use mathematical tools essential for analyzing quantitative problems and for producing solutions. (Theme: mathematical tools)

4. Apply advanced mathematical concepts and tools (algebra, calculus) essential in upper division academic work and/or workplace tasks. (Theme: advanced mathematical operations—algebra, calculus)

5. Select appropriate math strategies for solving and handling application problems involving (for example) finance, science, economics, and family issues. (Theme: mathematical problem-solving)

Course SLO	Assessment Method	Criterion Level
One sentence that describes a major piece of knowledge, skill, or ability that students can demonstrate by the end of the course *Finish the sentence, "At end of the course, the successful student will be able to… "*	**Major assignment, project or test used to demonstrate or apply outcome** *Remember to have a mix of qualitative and quantitative assessment methods.*	**Reflects satisfactory performance on the SLO** • *At least X percent of students achieve this course SLO.* • *All students achieve at least the Y level on this SLO.* • *At least X percent of students achieve the Y level on this course SLO.*
1. … Translate, evaluate, and simplify variable expressions involving rational numbers expressed as integers, common and decimal fractions, and percents	Students will answer questions embedded in a final exam. A scantron scanner or hand-count (for constructed-response questions) will be used to access the results for each of the relevant questions.	At least 60% of students will score at least 50% on this subscale. Each question will be answered correctly by at least 50% of students
2. … Construct and analyze graphs of linear functions	Students will answer questions embedded in a final exam. A scantron scanner or hand-count (for constructed-response questions) will be used to access the results for each of the relevant questions.	At least 40% of students will score at least 50% on this subscale. Each question will be answered correctly by at least 30% of students
3. …Solve linear equations and inequalities in one variable and systems of two linear equations in two variables.	Students will answer questions embedded in a final exam. A scantron scanner or hand-count (for constructed-response questions) will be used to access the results for each of the relevant questions.	At least 50% of students will score at least 50% on this subscale. Each question will be answered correctly by at least 40% of students
4… Create and use linear models to solve application problems in one and two variables	Students will answer questions embedded in a final exam. A scantron scanner or hand-count (for constructed-response questions) will be used to access the results for each of the relevant questions.	At least 30% of students will score at least 50% on this subscale. Each question will be answered correctly by at least 20% of students

Mapping to Program SLO and Institutional SLOs

Please indicate with an "X" in the appropriate boxes below, the Course SLO mapping to the corresponding Program and Institutional SLO(s).

Course SLO	Program SLO												Institutional SLO								
	1	2	3	4	5	6	7	8	9	10	11	12	A	B	C	D	E	F	G	H	I
#1	x		x										x		x						
#2	x		x										x		x			x			
#3	x	x	x	x											x						
#4	x		x	x	x								x	x	x						

Course SLO Acknowledgements

Current draft created by Bonnie Blustein 10/29/2012

See attachment for sample assessment tool (used in Spring 2012) with data and reflection.

Division Chair Matt Robertson	Date
SLO Coordinator Todd Matosic	Date
Dean Judith-Ann Friedman	Date
Curriculum Committee Chair Judy chow	Date
Academic Senate President Adrienne Foster	Date
VP of Academic Affairs (initial) and College President	Date

Math 117 Spring 2012 FINAL EXAM AND SLO Assessment

Blustein Sections 1481 & 1482

There are 32 math problems on this test (each worth 3 points) plus a four-point short essay question at the end.

GRADING RUBRIC

If some correct work is shown, partial credit will be assigned on the following basis:

Lose 1 point for each minor error   *   Lose 2 points for a major error.

A correct answer without the work/justification shown will also lose 2 points.

Letter grades will be assigned as follows:

$\geq$90 A   79-89 B   68-78 C   55-67 D   <55 F

SLO 1: Translate, evaluate, and simplify expressions involving rational numbers expressed as integers, common and decimal fractions, and percents

1 Simplify the following expression: $\dfrac{8}{21} \div \dfrac{-2}{3} \cdot \dfrac{1}{4}$

2. Write as a fraction in lowest terms. $8\dfrac{1}{3}\%$

3 Bay Area Rental Cars charges $14 a day and $0.18 per mile for renting a car. You rent a car for 5 days and drive 278 miles. Find the total cost of renting the car.

4. Find the perimeter of a triangle with sides 14.36 cm, 14.89 cm, and 18.2 cm.

5. Evaluate the variable expression when a = −7 and d = −2: $d + a^2(d - 2a)$

6. Simplify completely. −3(x − 8) −7(x + 6)

7 Translate into a variable expression:

    Twenty subtracted from the quotient of a number and negative five

8 A chemistry teacher passes 177 students out of the 300 students in the class. What percent of the students passed?

9. A sweater that usually sells for $95 is on sale for 20% off. What is the sale price?

SLO 2: Construct and analyze graphs of linear functions and linear inequalities in two variables

10. The table shows the enrollment at a Community College for selected years.

Year	1980	1985	1990	1995	2000	2005
Enrollment	2000	3300	3500	4300	4500	4800

What was the <u>average annual rate of change</u> of the enrollment from 1980 to 2005 (in students per year)? Use correct units.

11. Graph.

$$y = \frac{5}{3}x - 4$$

12. Find the *x*- and *y*-intercepts and use them to graph the equation.

$$3x - 5y = 15$$

13. Find the equation of the line, in slope-intercept form, that passes through the points

$(-3, 1)$ and $(5, -7)$.

14. Evaluate the function at the given value of *x*: $f(x) = -5x + 4, \quad x = -3$

15. Graph the solution set.

$$x - y > 1$$

SLO 3: Solve linear equations and inequalities in one variable and systems of two linear equations in two variables.

16.
Solve: $\dfrac{4}{11}x = -8$.

17. Solve the system:

$$8x + 5y = 14$$
$$4x + 15y = -18$$

18. Solve the system:

$$y = -x + 4$$
$$7x + 5y = 24$$

19.
Solve: $\dfrac{1}{3}(4x - 8) = \dfrac{5}{6}$

20. Solve: 7.2n + 4.6 = −17

21. Solve: 5n − 3(n + 4) = 4

22. Solve and graph the solution set: $-3x \le 6$
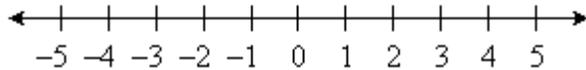
23 Write the following problem as an equation and solve.

The product of negative five and a number equals the sum of the number and twelve .

SLO 4: Create and use linear models to solve application problems in one and two variables (Approximate percentages with at most one minor error on each problem)

31% 24. Four times the first of three consecutive even integers is equal to the sum of the third even integer and negative sixteen. Find the three integers.

38% 25. The perimeter of a rectangle is 120 yds. The length of the rectangle is 3 yds less than twice the width. Find the length and width of the rectangle.

27% 26. An investor has a total of $46,000 invested in two simple interest accounts. The annual simple interest rate on one account is 1.16%. The annual simple interest rate on the second account is 0.25%. Write <u>an equation or system of equations</u> that could be used to find out how much is invested in each account if both accounts earn the same amount of interest. YOU DO NOT HAVE TO SOLVE THE EQUATION(S)

11% 27. How many ounces of pure orange juice must be added to 30 oz of a beverage that is 40% orange juice to produce a mixture that is 60% orange juice?

44% 28. A bicyclist leaves the Santa Monica Pier and travels at an average speed of 6 mph towards Malibu. Two hours later, a motorcyclist leaves the Pier traveling at an average speed of 18 mph in the same direction.   In how many hours after the motorcyclist leaves the Pier will it catch up with the bicyclist?

16% **29**. A small plane, flying into a headwind, flew 720 miles in 8 h. Flying with the wind, the plane traveled 450 miles in 3 h. Find the rate of the plane in calm air and the rate of the wind.

44% 30. A piggy bank has $6.10 in nickels and quarters. The number of quarters is eight less than the number of nickels. Write <u>an equation or system of equations</u> that could be solved to find the number of nickels and the number of quarters. YOU DO NOT HAVE TO SOLVE THE EQUATION(S)

38% **31.**   A phone company charges $39 per month plus $0.05 per minute. The function $C(x) = 39 + 0.05x$ represents the monthly cost where x is the number of minutes used. When the function is graphed, the point (620, 70) is on the line. Write a sentence explaining the meaning of this ordered pair.

25% 32.   Trail mix is made by combining raisins that cost $4.20 per pound with granola that costs $2.20 per pound. How many pounds of each should be used to make 40 lbs of trail mix that costs $2.75 per pound?

Comment: Application problems are at a higher level in Bloom's taxonomy than most of the other questions on this final examination. It is thus not surprising that perhaps half of the 62% who failed the exam were unable to solve any of the problems in this section.   It is reassuring that among the 21 students who passed the exam (38% of those who took it) the average number of points earned in this section (out of a maximum of 27) was 15.24 or 56%. That is, students passing the final exam and the course are not simply "riding" on lower-level skills.

Essay Question (4 points)

33. This course supports two WLAC Institutional Learning Outcomes:

a. *Quantitative Reasoning*
b. *Critical Thinking*.

Write one paragraph explaining what <u>each</u> of these means, giving at least one example of an activity or topic <u>from this course </u>that illustrates <u>each</u> one.