



KENYATTA UNIVERSITY
UNIVERSITY EXAMINATIONS 2008/2009

KU-BRAEBURN DEGREE PROGRAMMES

EXAMINATION FOR THE DEGREE OF MASTER OF PHILOSOPHY –
TEACHER MENTORING

MTM 513: MATHEMATICS TEACHER MENTORING

DATE: SATURDAY, 13TH DECEMBER 2008

TIME: 9.30 A.M. – 12.30 P.M.

INSTRUCTIONS: Answer three questions including question 1.

Question one

- i) Give three reasons why we teach mathematics. (8 marks)
- ii) A fellow colleague has trouble assisting students recall concepts learned. You realize this as situation of the types of understanding common in mathematics classrooms. What type of learning do you think take place in this class? Briefly justify your answer. (8 marks)
- iii) What are the G. Polya heuristics for problem solving. (6 marks)
- iv) What are the three different forms of averages, which is the most stable. Explain (4 marks)
- v) You are given 4 fractions; $\frac{5}{12}$, a, b, c, two fractions a and b are equally spaced between $\frac{5}{12}$ and c. If $a + b = \frac{4}{3}$ find the value of c. (8 marks)

Question two

- (i) Use either the arrow model or the counter model to demonstrate the following:
(a) $-10 + +13$ (b) $-4 - -9$ (c) $6 - -7$ (d) -4×-3 (12 marks)
- (ii) What misconceptions do children have about expressions such as $4 + 8$ and the equal sign that can cause difficulty working with equations. (8 marks)

Question Three

- (i) Describe in your own words the five different representations of a function and how they are related or actually represented the same theory. Use an example of your own to explain. (15 marks)
- (ii) Explain how to solve the equation $4x + 3 = x = 12$ using a pan balance. (5 marks)

Question four

- (i) Discuss the value of $\frac{3}{4}$ using the five different models of fractions; Area, Discrete, Rational and Quotient. (15 marks)
- (ii) How can you help students understand that a fraction such as $\frac{7}{8}$ means the same as $7 \div 8$. (5 marks)

Question five

- Either* (i) (a) Describe in your own words the first three van Hiele levels of geometric thought. (9 marks)
- (b) How would activities for these levels (0,1,2) differ. (6 marks)
- (c) What would you do if students in class were at different levels of thought. (5 marks)
- OR (ii) Explain the difference between theoretical probability, relative probability and experimental probability. (12marks)
- (iii) What are some misconceptions that students have when learning probability concepts. Explain the root cause of such misconceptions. (8 marks)
