

MT007

BINDURA UNIVERSITY OF SCIENCE EDUCATION

FACULTY OF SCIENCE EDUCATION

Diploma in Science Education II

MT 007: Applied Mathematics Education II:

Duration 3 hours

00 MAY 2019

Instructions

1. Answer all questions in Section A and any other two questions from Section B.
2. Start each question answer on a new page.
3. Present your answers neatly.

SECTION A [40 Marks]

Q1. a) Solve the inequality: $4x - 5 \leq 3x + 2 < 5x + 8$.

Show the solution set on a line graph. List the elements of Set I, the integer values of the solution of the inequality. [7]

b) Given that: $ax^2 + bx + c = 0$. Deduce the quadratic formula [5]

c) Solve the quadratic equation: $3x^2 - 5x - 9 = 0$, giving your answers correct to two significant figures. [5]

d) Structure a marking scheme for the quadratic equation you solved in (c). Justify each of the five marks awarded. [5]

Q2. Answer the whole of this question on a Single sheet of graph paper.

Mrs Gutu wants to buy at least 3 bags of mealie-meal and at least 4 bottles of cooking oil.

Let X be the number of bags of mealie meal and Y the number of bottles of cooking oil.

a) (i) Write two inequalities which satisfy these conditions. [2]

(ii) Mrs Gutu has \$ 3 000 to spend. A bag of mealie meal costs \$ 500 and a bottle of cooking oil costs \$ 150. Form an inequality in x and y and show that it reduces to:

$$10x + 3y \leq 60. \quad [2]$$

- (iii) She also wants to buy bottles of cooking oil that are more than the bags of mealie meal. Write another inequality satisfying this condition. [1]
- b) Using a scale of 2cm to represent 1 unit on the X- axis and 2cm to represent 2 units on the Y-axis, construct and indicate by shading the *Unwanted* regions, the region in which (x, y) satisfying all conditions must lie. [4]
- c) Use your graph to find the:
- (i) Number of possible combinations of bags of mealie meal and bottles of cooking oil that she can buy. [2]
 - (ii) Combination of (x, y) which gives the maximum amount to be spent.
 - (iii) Change when the least amount is spent. [3]
- d) Write two objectives assessed in this question. [4]

SECTION B [40 Marks]

Q3. Justify the need of a marking scheme for each mathematics task assigned to pupils. [20]

Q4.a) List five factors which affect pupils' performance in mathematics. [5]

b) Describe teaching method(s) you can use to reduce the effects of one of the factors. [15]

Q5. Structure a lesson –plan to teach pupils to use a calculator. [20]

Q6. A pupil intends to drop mathematics at form three. What arguments will you make to stop the pupil from dropping mathematics. [20]

END of EXAMINATION PAPER