4.6 Decision: Linear Programming and Critical Path Depth: 10-minute Pack

EDEXCEL 9FM0 · Calculator allowed · about 10 minutes

Total Marks

Name: _____ Date: ____ / ____ / _____

Answer ALL questions. Show all your working.

1 A bakery makes x batches of rolls and y batches of loaves each day. The constraints are $4x + 3y \leq 61$, $3x + y \leq 37$, $x \geq 0$ and $y \geq 0$. The profit, in hundreds of pounds, is $P = x + 5y$, and the profit is to be maximised.

(a) Draw the feasible region and find the coordinates of each of its vertices. **(3)**

(b) Evaluate P at each vertex and hence find the maximum profit and the values of x and y which give it. **(3)**

(Total for Question 1 is 6 marks)

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Mark scheme · 4.6 Decision: Linear Programming and Critical Path Depth: 10-minute Pack

Question 1

(a) plots both constraint lines and shades the unwanted region	**M1**
(a) finds the intercepts with the axes and the intersection of the two lines	**M1**
(a) vertices: (0, 0), (0, 61/3), (10, 7), (37/3, 0)	**A1**
(a) Answer: (0, 0), (0, 61/3), (10, 7), (37/3, 0)	
(b) evaluates P at each vertex	**M1**
(b) values: 0, 305/3, 45, 37/3	**A1**
(b) maximum P = 305/3 at (0, 61/3)	**A1**
(b) Answer: P = 305/3 at (0, 61/3)	

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