4.4 Decision Maths: Critical Path Analysis and Linear Programming: 10-minute Pack

EDEXCEL 9FM0 · Calculator allowed · about 10 minutes

Total Marks

Name: _____ Date: ____ / ____ / _____

Answer ALL questions. Show all your working.

1 A farmer plants x hectares of wheat and y hectares of barley. The constraints are $4x + 2y \leq 48$, $2x + 2y \leq 32$, $x \geq 0$ and $y \geq 0$. The profit, in hundreds of pounds, is $P = 4x + 3y$, 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 · 4.4 Decision Maths: Critical Path Analysis and Linear Programming: 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, 16), (8, 8), (12, 0)	**A1**
(a) Answer: (0, 0), (0, 16), (8, 8), (12, 0)	
(b) evaluates P at each vertex	**M1**
(b) values: 0, 48, 56, 48	**A1**
(b) maximum P = 56 at (8, 8)	**A1**
(b) Answer: P = 56 at (8, 8)	

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