



QUESTION WORKBOOK

Linear programming: formulation and graphical solution

Decision Mathematics 1 · Year FM

6 questions · 20 marks

NAVY SCREEN EDITION

SECTION A · Warm-up

A1 State the three things a formulated linear program must contain, and one thing candidates most often leave out. [2]

A2 Write $3x + 2y \leq 20$ and $5x + 2y \geq 30$ as equations, introducing the appropriate extra variables. [3]

SECTION B · Standard

B1 Maximise $P = 4x + 5y$ subject to $x + y \leq 10$, $2x + 3y \leq 24$ and $x, y \geq 0$, using the vertex method. [4]

- B2** Describe the objective line method for the same problem, and say what it shows that the vertex method does not. [4]

- B3** Find the value of each slack variable at the optimum and say what it means. [3]

SECTION C · Stretch

- C1** Explain how the answer would change if x and y had to be whole numbers, and why rounding a corner is not a safe method. [4]