6.

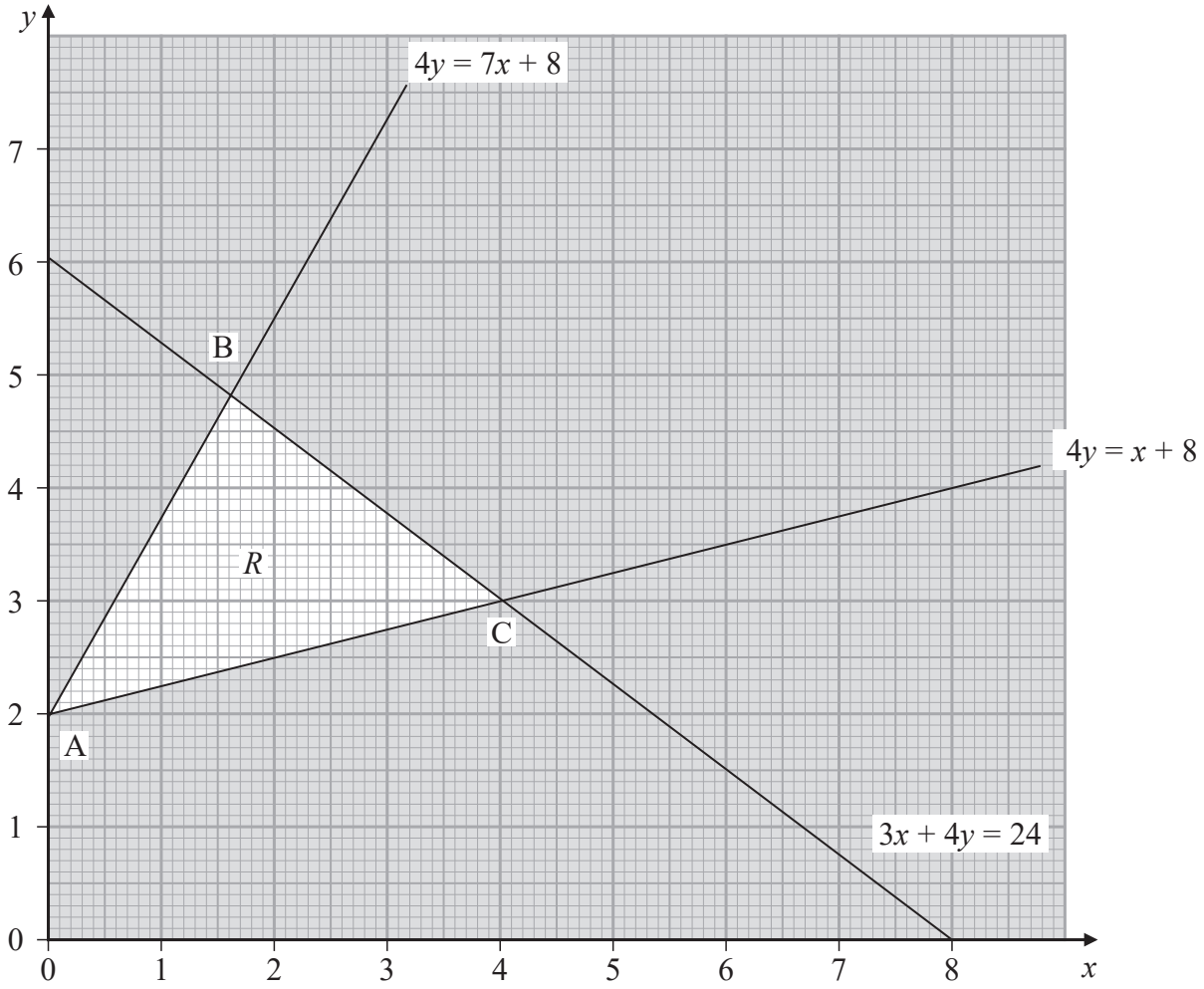


Figure 2

The graph in Figure 2 is being used to solve a linear programming problem in x and y. The three constraints have been drawn on the graph and the rejected regions have been shaded out. The three vertices of the feasible region R are labelled A, B and C.

(a) Determine the inequalities that define R.

(2)

The objective function, P, is given by

$$P = ax + by$$

where a and b are positive constants.

The minimum value of P is 8 and the maximum value of P occurs at C.

(b) Find the range of possible values of a. You must make your method clear.

(5)

(Total 7 marks)