5.

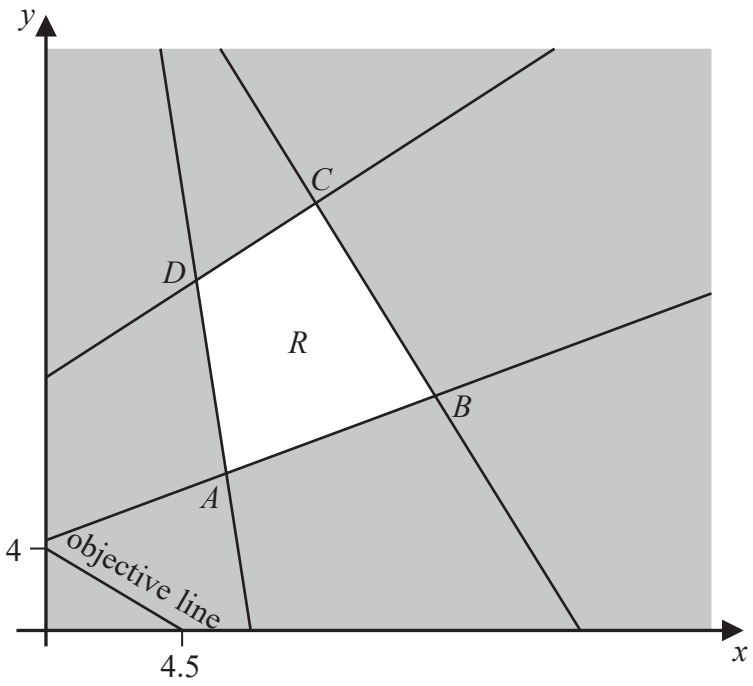


Figure 3

Figure 3 shows the constraints of a linear programming problem in x and y.
The unshaded area, including its boundaries, forms the feasible region, R.

The four vertices of R are $A(6, 8)$, $B(13, 12)$, $C(9, 22)$ and $D(5, 18)$.

An objective line has been drawn and labelled on the graph.

When the objective function, P, is maximised, the value of P is 540

When the objective function, P, is minimised, the value of P is k

Determine the value of k. You must make your method and working clear.

(You may assume that the objective function, P, takes the form $ax + by$ where a and b are constants.)

(Total for Question 5 is 5 marks)