

4. The curve with equation  $y = 2 \ln(8 - x)$  meets the line  $y = x$  at a single point,  $x = \alpha$ .

(a) Show that  $3 < \alpha < 4$

(2)

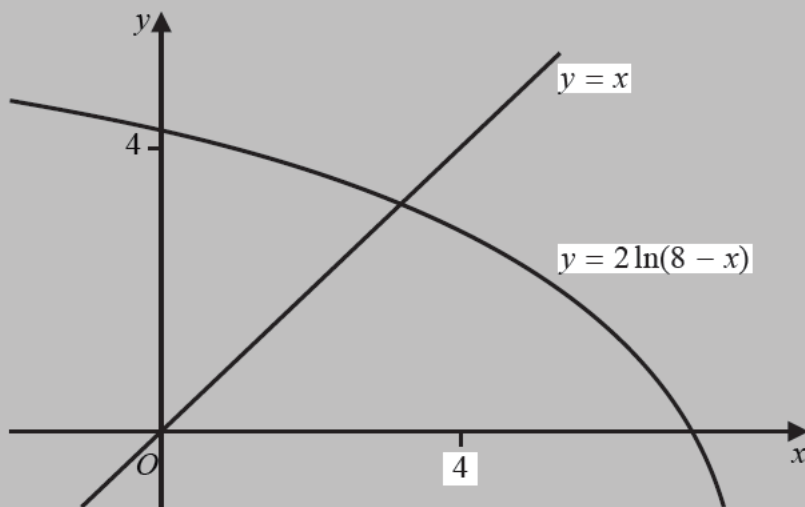


Figure 2

Figure 2 shows the graph of  $y = 2 \ln(8 - x)$  and the graph of  $y = x$ .

A student uses the iteration formula

$$x_{n+1} = 2 \ln(8 - x_n), \quad n \in \mathbb{N}$$

in an attempt to find an approximation for  $\alpha$ .

Using the graph and starting with  $x_1 = 4$

(b) determine whether or not this iteration formula can be used to find an approximation for  $\alpha$ , justifying your answer.

(2)