

6 The equation $6 \arcsin(2x - 1) - x^2 = 0$ has exactly one real root.

(a) Show by calculation that the root lies between 0.5 and 0.6.

[2]

In order to find the root, the iterative formula

$$x_{n+1} = p + q \sin(rx_n^2),$$

with initial value $x_0 = 0.5$, is to be used.

(b) Determine the values of the constants p , q and r .

[2]

(c) Hence find the root correct to 4 significant figures. Show the result of each step of the iteration process.

[2]