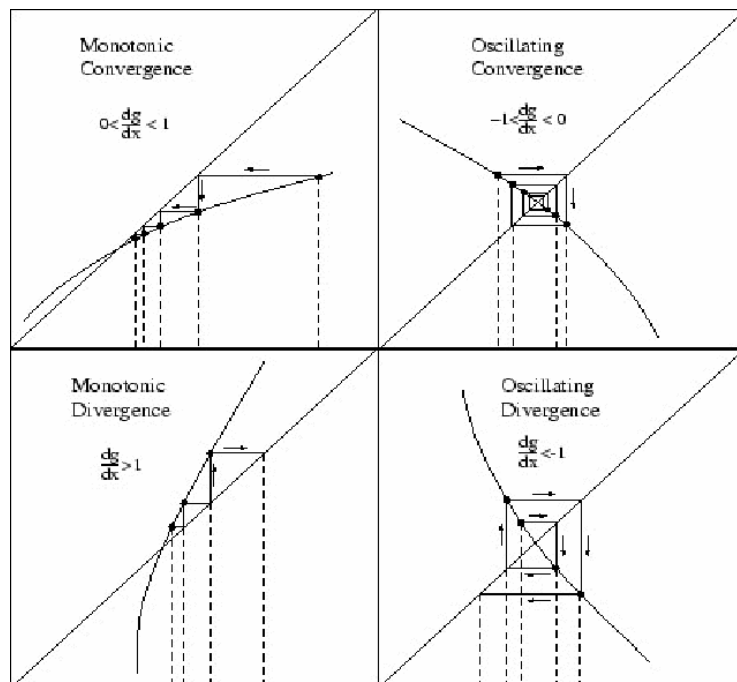


10B Iterations



1. Given that $f(x) = x^2 - 4x + 1$

a) Show that the equation $f(x) = 0$ can be written as $x = 4 - \frac{1}{x}$, $x \neq 0$.

The equation $f(x)$ has a root, α , in the interval $3 < x < 4$.

b) Use the iterative formula

$x_{n+1} = 4 - \frac{1}{x_n}$, with $x_0 = 3$ to find the value of x_1 , x_2 and x_3 .

2.

$$f(x) = x^3 - 3x^2 - 2x + 5$$

a) Show that the equation $f(x) = 0$ has a root in the interval $3 < x < 4$

b) Use the iterative formula:

$$x_{n+1} = \sqrt{\frac{x_n^3 - 2x_n + 5}{3}}$$

To calculate the values of x_1 , x_2 and x_3 , giving answers to 4 decimal places, when:

i) $x_0 = 1.5$ ii) $x_0 = 4$