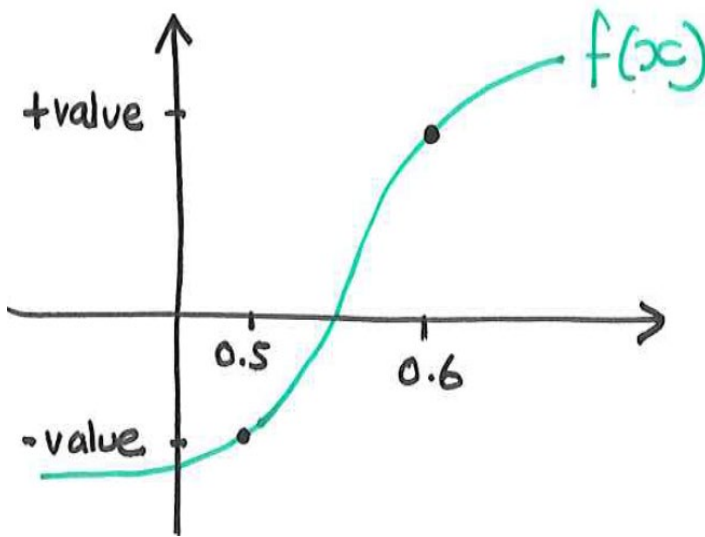


Year 2 Pure Chapter 10 – Numerical Methods

Locating Roots Between Two Values



$f(0.5) = \text{negative value}$

$f(0.6) = \text{positive value}$

change of sign
and continuous function

$\therefore$ root between
0.5 and 0.6

Show a Value is a Possible Root

Root $\lambda = 2.307$

Check either side of the
number.

Use upper and lower
bound values.

$f(2.3065) = \text{negative value}$

$f(2.3075) = \text{positive value}$

change of sign
and continuous function
between
[2.3065 and 2.3075]

so $\lambda = 2.307$
is a root to 3d.p.

Iteration

Use the previous answer to locate a more accurate answer.

$$x_{n+1} = 2x_n + 4$$

$$x_1 = 3$$

$$x_2 = 2(3) + 4 = 10$$

$$x_3 = 2(10) + 4 = 24$$

Newton Raphson

A formula for finding roots.

$$x_{n+1} = x_n - \frac{f(x)}{f'(x)}$$

Given in the formula booklet.
