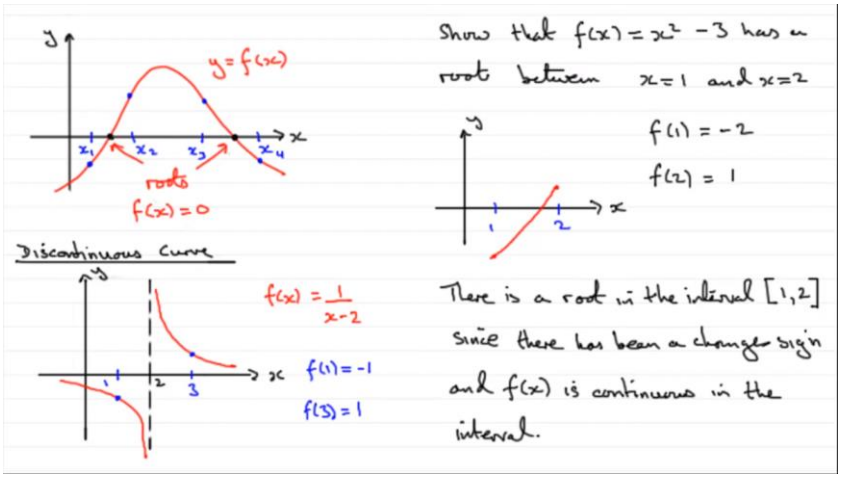
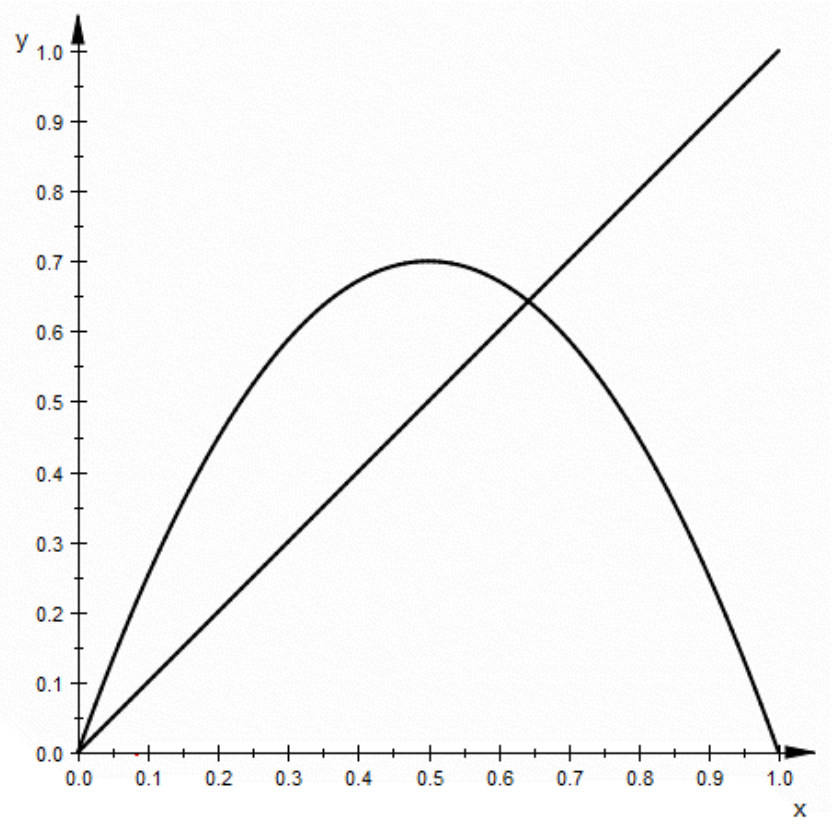
I - Numerical Methods

How is change of sign used to find roots? And when does it not work / fail?	• Look for a change of sign between 2 points.
	
	• Fails when…
	  ○ The interval was not narrow enough, captured an even number of roots (including repeated roots).
	  ○ The graph is **<u>discontinuous</u>** in the interval.
	 

When does an iteration converge? How can this be drawn?	Let g(x) have a solution α **Key point** If $-1 < g'(x) < 1$ for all x in an interval which contains α and the starting value x_1, then $x_{n+1} = g(x_n)$ converges. An animation of the cobweb is drawn below:

	 *This works since finding the point of intersection is the same as finding roots.*
What is the trapezium rule?