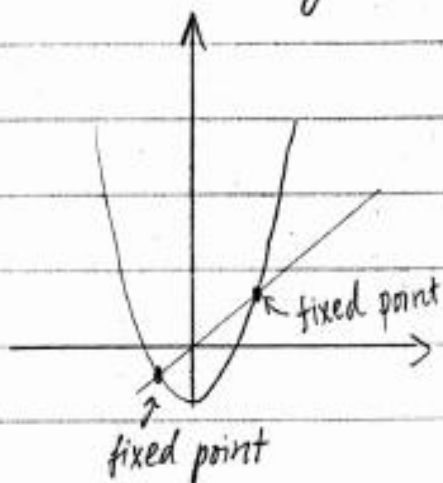


Ex1: Find the fixed points of the function
 $g(x) = x^2 - 6$



$$\begin{aligned}g(x) &= x \\x^2 - 6 &= x \\x^2 - x - 6 &= 0 \\(x-3)(x+2) &= 0 \\x &= 3, \quad x = -2\end{aligned}$$

Indeed, $g(3) = 3^2 - 6 = 9 - 6 = 3$
 $g(-2) = (-2)^2 - 6 = 4 - 6 = -2$

Theorem 2.2.9) If $g(x) \in C[a, b]$ and

$a \leq g(x) \leq b$ for all $x \in [a, b]$
then $g(x)$ has a fixed point in $[a, b]$
b) If in addition, $g'(x)$ exists on (a, b) and
a positive constant $k < 1$ exists with
 $|g'(x)| \leq k \quad \forall x \in (a, b)$

then the fixed point in $[a, b]$ is unique.