1-1 Videos Guide

1-1a

Definition: (one-to-one)

- o A function f is one-to-one if $f(x_2) \neq f(x_1)$ whenever $x_2 \neq x_1$.
- A description of inverse functions

1-1b

Theorems (statement and proof):

- If f is one-to-one and continuous on $[a, b]$, then f^{-1} is also continuous.
- $(f^{-1})'(a) = \dfrac{1}{f'(f^{-1}(a))}$

1-1c

Exercises:

- If $f(x) = x^5 + x^3 + x$, find $f^{-1}(3)$ and $f(f^{-1}(2))$.
- Find $(f^{-1})'(a)$ for $f(x) = x^3 + 3\sin x + 2\cos x$ and $a = 2$.

1-1d

Exercise:

- Let $f(x) = \sqrt{x - 2}$ and $a = 2$.
- a) Show that f is one-to-one
- b) Find $(f^{-1})'(a) = \dfrac{1}{f'(f^{-1}(a))}$