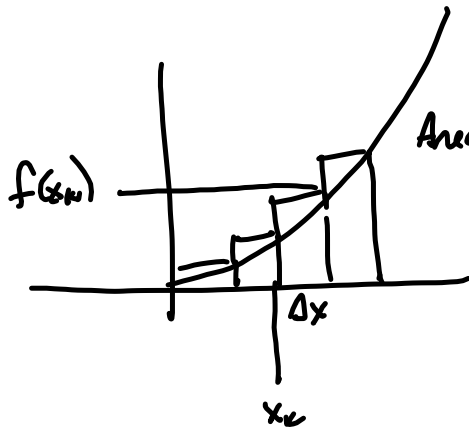


$\lim_{h \rightarrow 0} \frac{f(x+h) - f(x)}{h}$
 Slope of secant line
 $\xrightarrow{h \rightarrow 0}$ Slope of tangent line.



Area $\approx \sum f(x_k) \Delta x$

$\xrightarrow{\Delta x \rightarrow 0}$ Area (EXACT!)

2 hours out \forall hour in.

for all, for each,
for every, for any.

\exists - There is, There exists.

\ni - So that, such that.

$A \in \{A, B, C\}$

Domain:

$$\frac{\text{STUFF}}{0} \text{ bad}$$

$$\sqrt[2n]{\text{negative}} \text{ bad}$$

Need Statement

What's the domain of

$$f(x) = \sqrt{7x-3}$$

Need: $7x-3 \geq 0$ (Not negative)

$$\Rightarrow \begin{aligned} & \Rightarrow 7x \geq 3 \\ \Rightarrow \mathcal{D} &= \left\{ x \mid x \geq \frac{3}{7} \right\} = \left[\frac{3}{7}, \infty \right) \end{aligned}$$

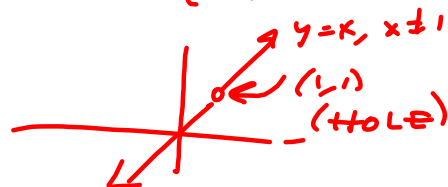
$$g(x) = \frac{7x-1}{\sqrt{7x-1}}$$

Rationalize:

$$g(x) = \frac{7x-1}{\sqrt{7x-1}} = \frac{7x-1}{\sqrt{7x-1}} \cdot \frac{\sqrt{7x-1}}{\sqrt{7x-1}} = \frac{\cancel{(7x-1)} \sqrt{7x-1}}{\cancel{7x-1}} = \sqrt{7x-1}$$

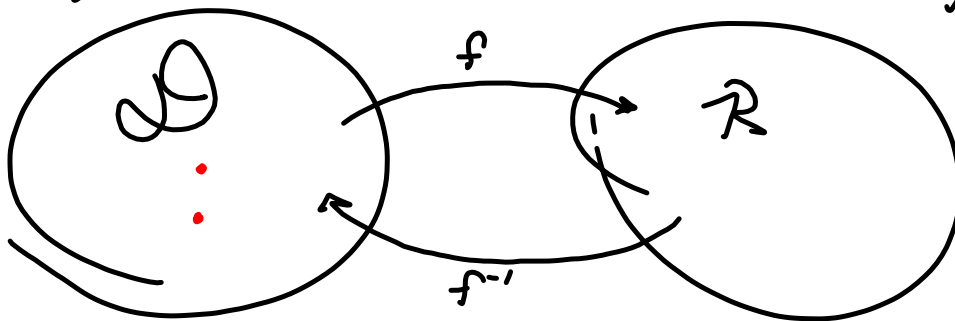
$x \neq \frac{1}{7}$
 Remembers where it came from

$$\frac{3x^2-3x}{3x-3} = \frac{3x \cancel{(x-1)}}{3 \cancel{(x-1)}} = x \quad (x \neq 1)$$



A function is a rule assigning one element in the Range to one element in the domain.

A 1-to-1 function is a function that assigns exactly one element of the domain to each element in the range.



f^{-1} is a function if f is 1-to-1.