

Lecture 1: 1.1-1.3

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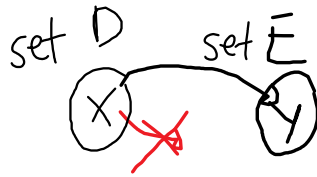
Key Points

Notes

Functions (1.1-1.3)

Definition of a function

$$y=f(x)$$



--> only one arrow from D to E

- For every x value there is only one corresponding y value

D is called the domain of f,

E is called the range of f

Ex: $f(x) = \sqrt{x}$



Domain: $f: \mathbb{R}_0^+$
Range: also \mathbb{R}_0^+

not defined here

Types of functions

Important functions

- Polynomial $f(x) = 3x^2 + 2x + 1$
- Rational $f(x) = \frac{2x+1}{3x^2+5}$ (fraction of polynomial functions)
- Linear (special polynomial function) $f(x) = mx + d$, $m, d \in \mathbb{R}$
--> lines
- Trigonometric functions $f(x) = \cos(x), \sin(x)$
- Exponential functions $f(x) = e^x$ $e \approx 2.71$
- Logarithmic functions $f(x) = \log(x)$
- Power functions (special polynomial function)
 $f(x) = x^3, x^4, x^7, x^{-2}, \frac{1}{x^2}$