

①

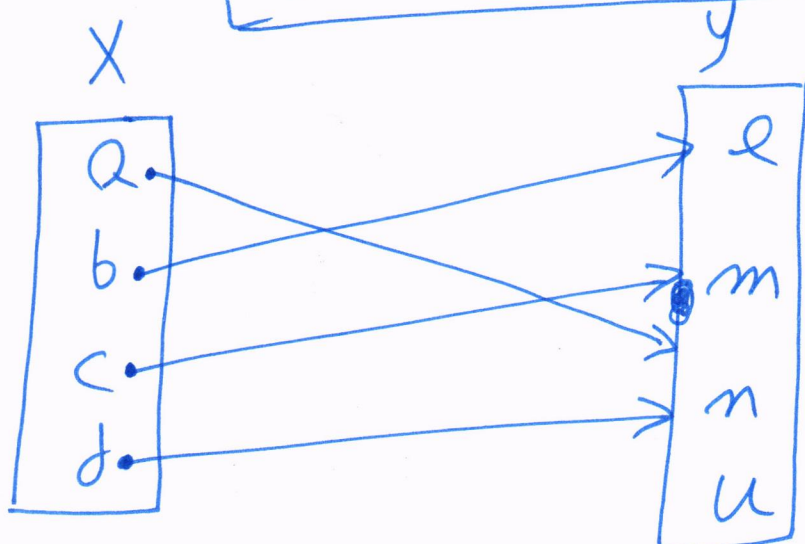
① Functions

①

$$F: X \longrightarrow Y$$

$\downarrow$ $\downarrow$
 Domain Codomain

$$y = F(x)$$



$$D_F = \{a, b, c, d\}$$

$$CD_F = \{e, m, n, u\}$$

$$Rng = R_F = \{e, m, n\}$$

②

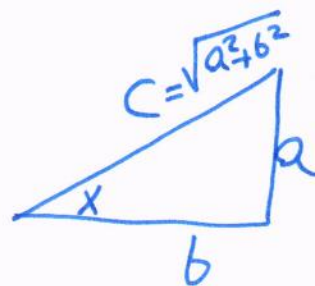
$$1) y = a_0 + a_1 x + a_2 x^2 + \dots + a_n x^n$$

$$2) y = \frac{F_1(x)}{F_2(x)}$$

$$y = F_1(x) F_2(x)$$

$$3) y = a^{F(x)}$$

$$y = \sin x = \frac{a}{c}$$



$$y = \cos x = \frac{b}{c}$$



$$y = \tan x = \frac{a}{b} = \frac{\sin x}{\cos x}$$



$$y = \cot x = \frac{1}{\tan x} = \frac{\cos x}{\sin x} = \frac{b}{a}$$

$$y = \sec x = \frac{1}{\cos x} = \frac{c}{b}$$

$$y = \csc x = \frac{1}{\sin x} = \frac{c}{a}$$

Inverse trigonometric

(3)

$$\sin^{-1} x \neq \frac{1}{\sin x}$$

$$\frac{1}{\sin x} = \csc x$$

$$\sin 30 = \frac{1}{2}$$

$$\sin^{-1} \frac{1}{2} = 30^\circ$$

$$y = \sin^{-1} x$$

$$y = \cos^{-1} x$$

$$y = \tan^{-1} x$$

$$y = \cot^{-1} x$$

$$y = \sec^{-1} x$$

$$y = \csc^{-1} x$$

$$y = a^x$$

$$a > 0$$

$$\frac{x^3}{3x}$$

$$a = e \approx 2.718...$$

$$y = e^x$$

$$y = \log_a x$$

$$a > 0$$

$$a = e \approx 2.7$$

$$y = \log_e x = \ln x$$

④

$$a^x a^y = a^{x+y}$$

$$\ln ab = \ln a + \ln b$$

$$\frac{a^x}{a^y} = a^{x-y}$$

$$\ln \frac{a}{b} = \ln a - \ln b$$

$$(a^b)^c = a^{bc}$$

$$\ln a^b = b \ln a$$

$$\ln e = 1$$

$$y = \sinh x = \frac{e^x - e^{-x}}{2}$$

$$y = \cosh x = \frac{e^x + e^{-x}}{2}$$

$$y = \tanh x = \frac{e^x - e^{-x}}{e^x + e^{-x}}$$

$$y = \coth x = \frac{e^x + e^{-x}}{e^x - e^{-x}}$$

(5)

$$y = \operatorname{sech} x = \frac{2}{e^x + e^{-x}}$$

$$y = \operatorname{cosech} x = \frac{2}{e^x - e^{-x}}$$

$$\cos^2 x + \sin^2 x = 1$$

$$\sec^2 x = 1 + \tan^2 x$$

$$\operatorname{cosec}^2 x = 1 + \cot^2 x$$

$$\sin 2x = 2 \sin x \cos x$$

$$\cos 2x = \cos^2 x - \sin^2 x$$

$$= 2 \cos^2 x - 1$$

$$= 1 - 2 \sin^2 x$$

$$\sin(a \pm b) = \sin a \cos b \pm \cos a \sin b$$

$$\cos(a \pm b) = \cos a \cos b \mp \sin a \sin b$$

$$\tan(a \pm b) = \frac{\tan a \pm \tan b}{1 \mp \tan a \tan b}$$