

Chapter 1

one

1.1 one

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to write an equation in text $a^2 + b^2 = c^2$ like

$$x^2 + y^2 = z^2 \tag{1.1}$$

$f(x) = \log(x)$ known as a monotonic ¹ functions in mathematics.

1. first
 2. second
 3. third
- apple
 - orange
 - banana

one	two
three	four
one	two
three	four

¹Functions are known as monotonic if they are increasing or decreasing in their entire domain

left	right
left2	right2

null	null	null	null	null
null	null	null	null	null
null	null	null	null	null
null	null	null	null	null
null	null	null	null	null

null	null	null	null	null
null	null	null	null	null
null	null	null	null	null
null	null	null	null	null
null	null	null	null	null

$$\frac{a}{b} = \sqrt[3]{9} \quad (1.2)$$

this is equation num2 (1.3)

Here is a displayed

$$\int \frac{d\theta}{1+\theta^2} = \tan^{-1} \theta + C \quad (1.4)$$

equation.

$$a + b \quad (1.5)$$

$$= c + d + g + h \quad (1.6)$$

$$= e + f \quad (1.7)$$

$$a = h + b \quad (1.8)$$

$$= (c + d + g + h) - e + f \quad (1.9)$$

equation number = 1.8

Solve for a sphere:

$$V = \iiint \rho^2 \sin \theta d\rho d\theta d\varphi \quad (1.10)$$

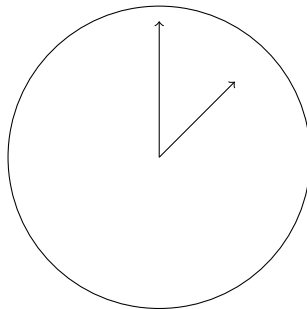
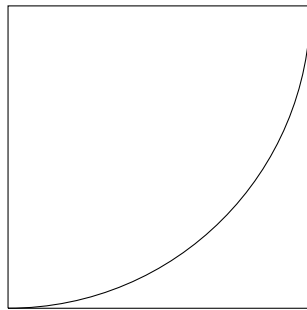
$$= \int_0^{2\pi} \int_0^\pi \int_0^r \rho^2 \sin \theta d\rho d\theta d\varphi \quad (1.11)$$

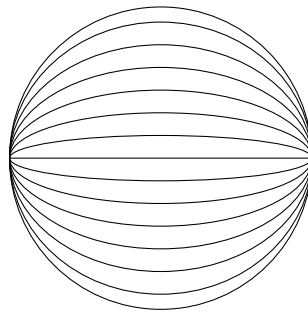
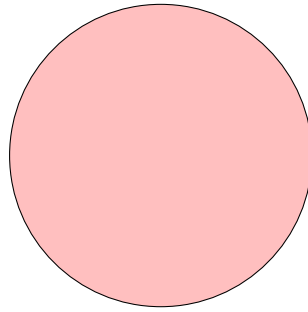
$$= 2\pi \int_0^\pi \int_0^r \rho^2 \sin \theta d\rho d\theta \quad (1.12)$$

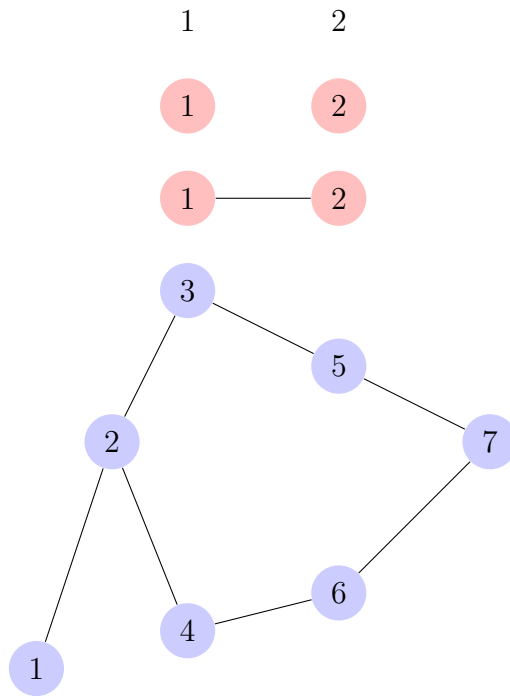
$$= 4\pi \int_0^r \rho^2 d\rho \quad (1.13)$$

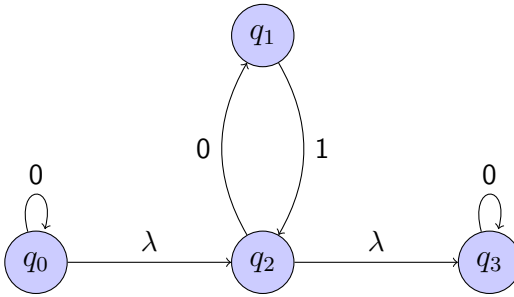
$$= \frac{4\pi}{3} \rho^3 \quad (1.14)$$

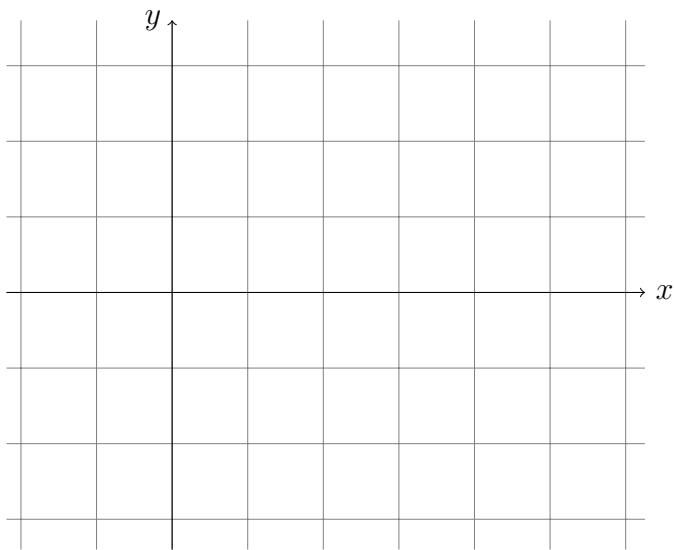
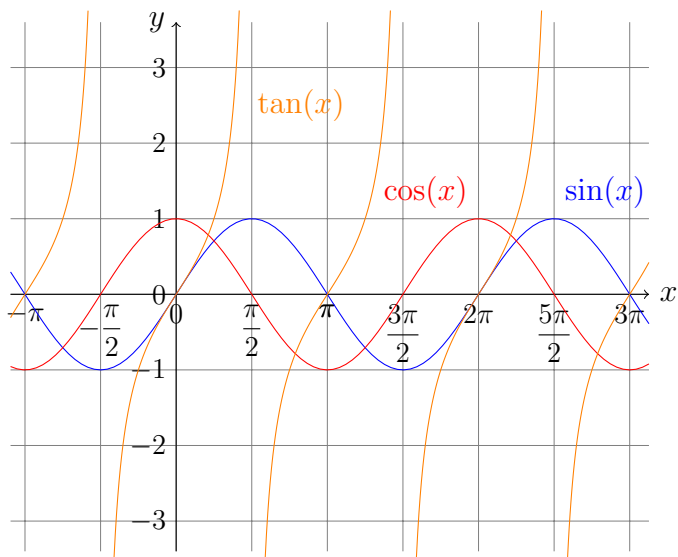
$$\begin{cases} 0 & x \leq 0 \\ \frac{100-x}{100} & 0 \leq x \leq 100 \\ 0 & 100 \leq x \end{cases}$$

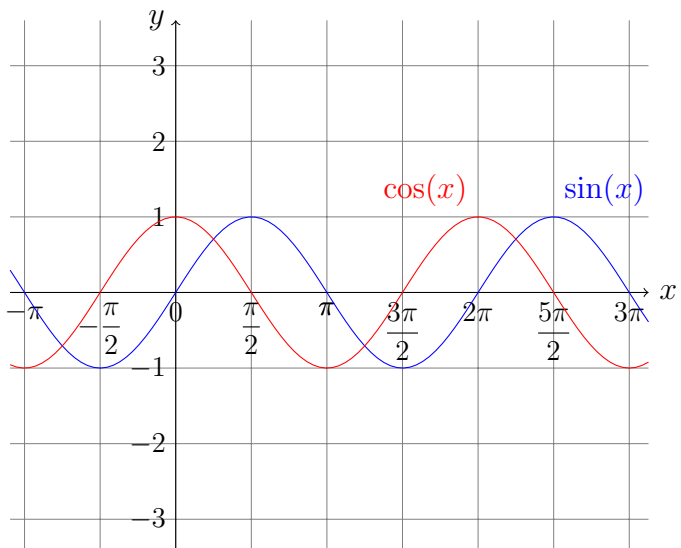
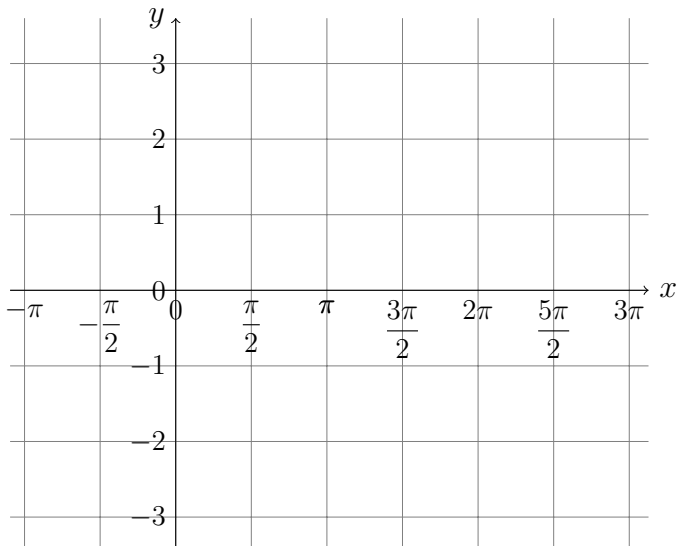


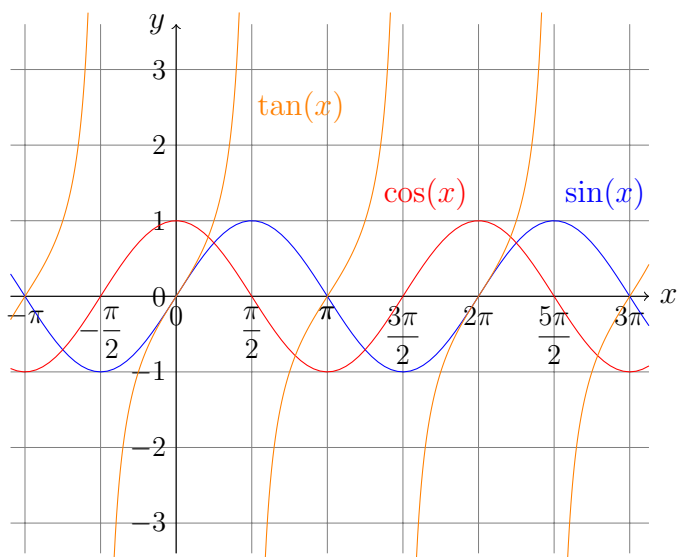














$$\underbrace{\begin{bmatrix} a & b & \dots & n \\ a & b & \dots & n \\ \vdots & \vdots & \vdots & \vdots \\ a & b & \dots & n \end{bmatrix}}_{\Phi} \underbrace{\begin{bmatrix} w_1 \\ w_2 \\ \vdots \\ w_n \end{bmatrix}}_{\mathbf{w}} \approx \underbrace{\begin{bmatrix} y_1 \\ y_2 \\ \vdots \\ y_n \end{bmatrix}}_{\mathbf{y}}$$

$$\begin{cases} 0 & x \leq 0 \\ \frac{100-x}{100} & 0 \leq x \leq 100 \\ 0 & 100 \leq x \end{cases}$$