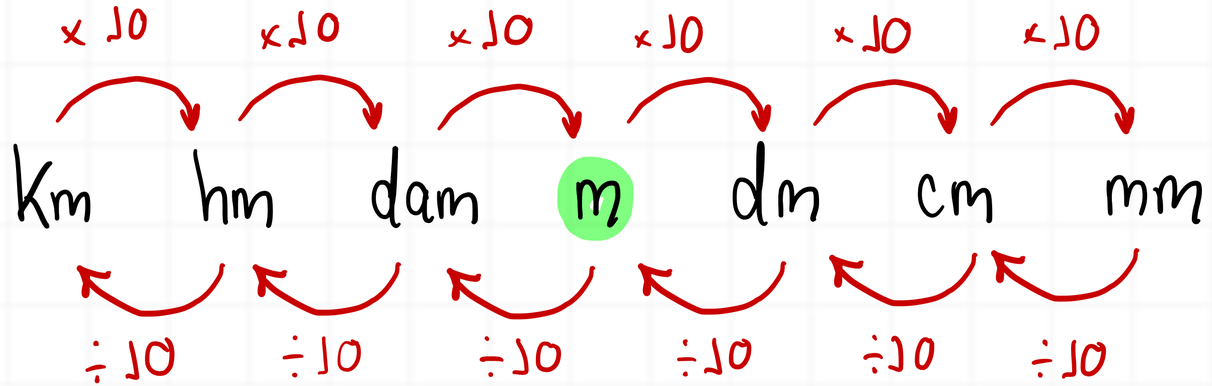
Módulo ① Matemática Aplicada à Física

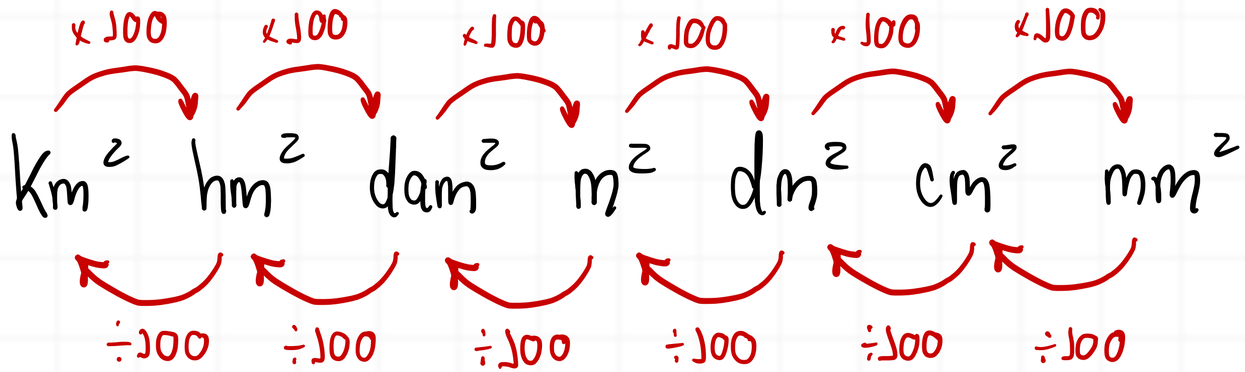
01. Unidades de Medidas

A) Comprimento

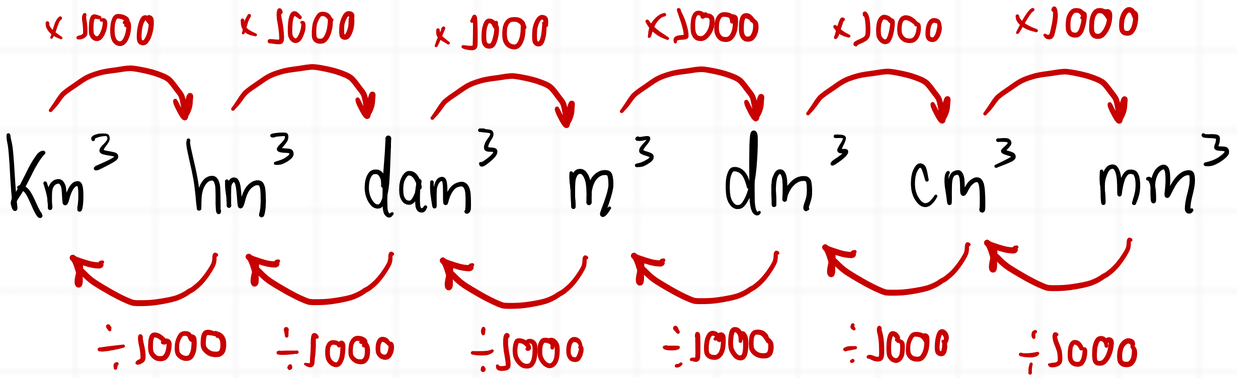


MODO TURBO | A

B) ÁREA



C) Volume



$1\ dm^3 = 1L$

$1\ m^3 = 1000L$

$1\ cm^3 = 1\ mL$

MODO TURBO | A

3) Prefixos importantes

Giga (G) = 10^{9}

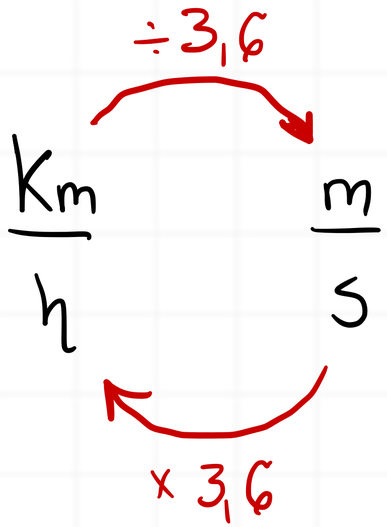
Mega (M) = 10^{6}

Micro (μ) = 10^{-6}

Nano (n) = 10^{-9}

E) Unidades compostas

$$\frac{Km}{h} = \frac{1000\ m}{3600\ s} = \frac{1}{3,6}\ \frac{m}{s}$$



02. Notação Científica

MODO TURBO | A

$a \times 10^{n}$ → n: número inteiro

a: entre 1 e 10

Ex:

$2048 = 2{,}048 \times 10^{3}$

$0{,}00391 = 3{,}91 \times 10^{-3}$

Regra:

VÍRGULA PARA A ESQUERDA → AUMENTA O EXPOENTE

VÍRGULA PARA A DIREITA → DIMINUI O EXPOENTE

03. EQUAÇÃO DO 1º GRAU

MODO TURBO | A

$$\frac{x}{5} + \frac{3x}{4} = 38$$

$$\frac{4x + 15x}{20} = 38$$

1 2

$$\frac{19x}{20} = 38$$

$$x = 40$$

04. Equação do 2º Grau

MODO TURBO | A

$$x^2 - 4x + 3 = 0$$

$$\Delta = b^2 - 4ac$$

$$\Delta = 16 - 12 = 4$$

$$\frac{-b \pm \sqrt{\Delta}}{2a} = \frac{4 \pm 2}{2} \begin{cases} x' = 3 \\ x'' = 1 \end{cases}$$

$$S = \frac{-b}{a} = 4$$

$$P = \frac{c}{a} = 3$$

$x' = 3 \quad x'' = 1$

05. Relação de Proporcionalidade

MODO TURBO | A

$\frac{A}{B} = K$ (×2 em A, ×2 em B)

$A = K \cdot B$ (×2 em A, ×2 em B)

$A \cdot B = K$ (×2 em A, ÷2 em A·B)

$A = \frac{K}{B}$ (×2 em B, ÷2 em A)

$A = \frac{K}{B^2}$ (×2 em B^2, ÷4 em A)

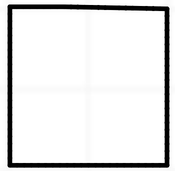
$A = K \cdot B^2$ (×2 em B^2, ×4 em A)

$A = K \cdot \sqrt{B}$ (×4 em $\sqrt{B}$, ×2 em A)

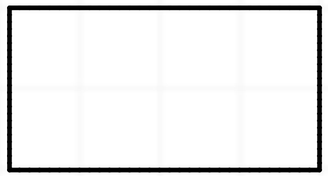
$A = \frac{K}{\sqrt{B}}$ (×4 em $\sqrt{B}$, ÷2 em A)

$T = 2\pi\sqrt{\frac{L}{g}}$

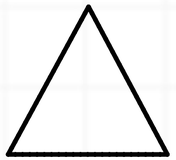
06. Geometria



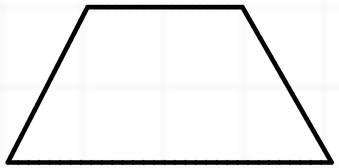
$$A = \ell^2$$



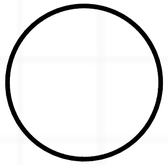
$$A = b \cdot h$$



$$A = \frac{b \cdot h}{2}$$

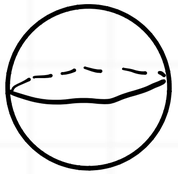


$$A = \frac{(B+b) \cdot h}{2}$$



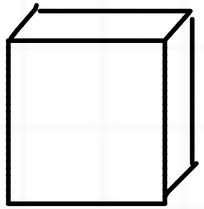
$$C = 2\pi R$$

$$A = \pi R^2$$

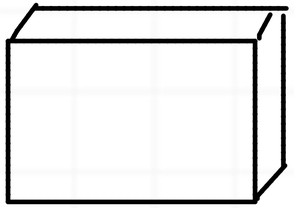


$$A = 4\pi R^2$$

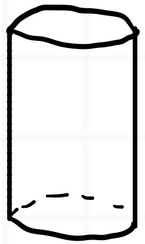
$$V = \frac{4}{3}\pi R^3$$



$$V = \ell^3$$



$$V = a \cdot b \cdot c$$



$$V = A \cdot h$$

MODO TURBO | A

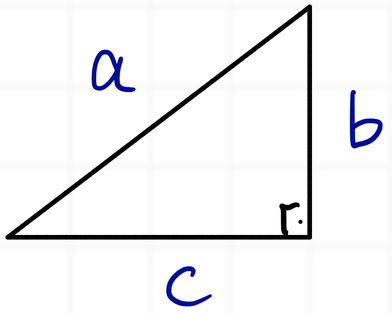
07. Trigonometria

MODO TURBO | A

A) Medida de Ângulos

0°	0 rad
30°	$\pi/6$ rad
45°	$\pi/4$ rad
60°	$\pi/3$ rad
90°	$\pi/2$ rad
180°	π rad
360°	2π rad

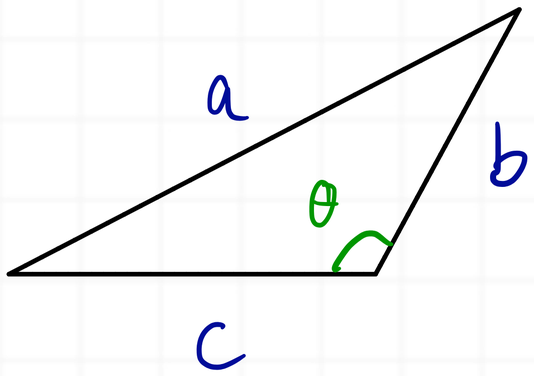
B) Teorema de Pitágoras



$$a^2 = b^2 + c^2$$

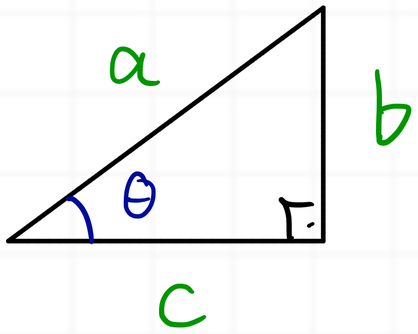
MODO TURBO | A

c) Lei dos Cossenos



$$a^2 = b^2 + c^2 - 2b \cdot c \cdot \cos\theta$$

3) Razões Trigonométricas



$$\operatorname{sen}\theta = \frac{b}{a}$$

$$\cos\theta = \frac{c}{a}$$

$$\operatorname{tg}\theta = \frac{b}{c}$$

	30°	45°	60°
sen	$1/2$	$\sqrt{2}/2$	$\sqrt{3}/2$
cos	$\sqrt{3}/2$	$\sqrt{2}/2$	$1/2$
tg	$\sqrt{3}/3$	1	$\sqrt{3}$

$$\frac{x}{10} = 0{,}8$$

$$x = 8$$

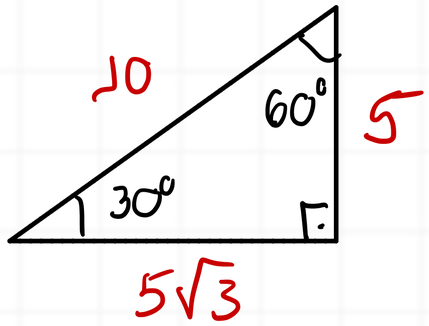
$$\frac{y}{10} = 0{,}6$$

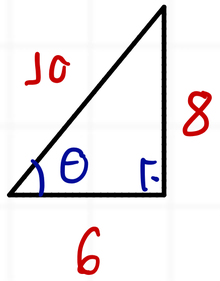
$$y = 6$$

$\operatorname{sen}\theta = 0{,}8$

$\cos\theta = 0{,}6$

OBS:

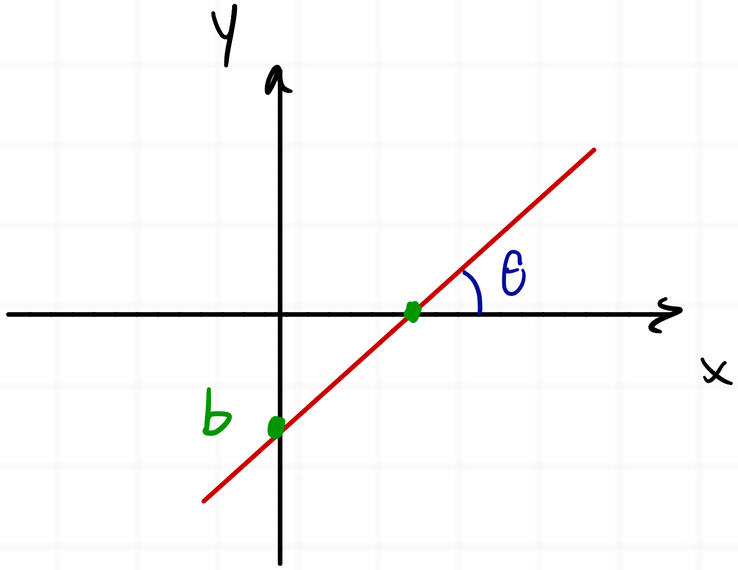


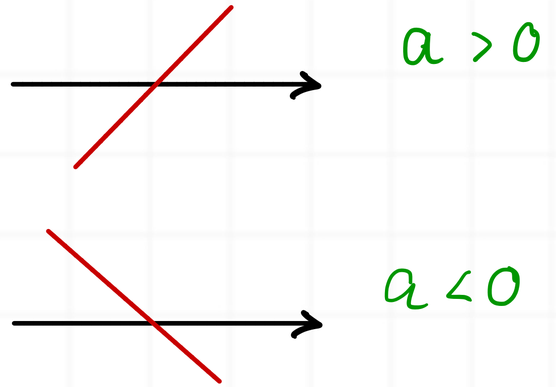


08. FUNÇÕES

A) FUNÇÃO DO 1º GRAU

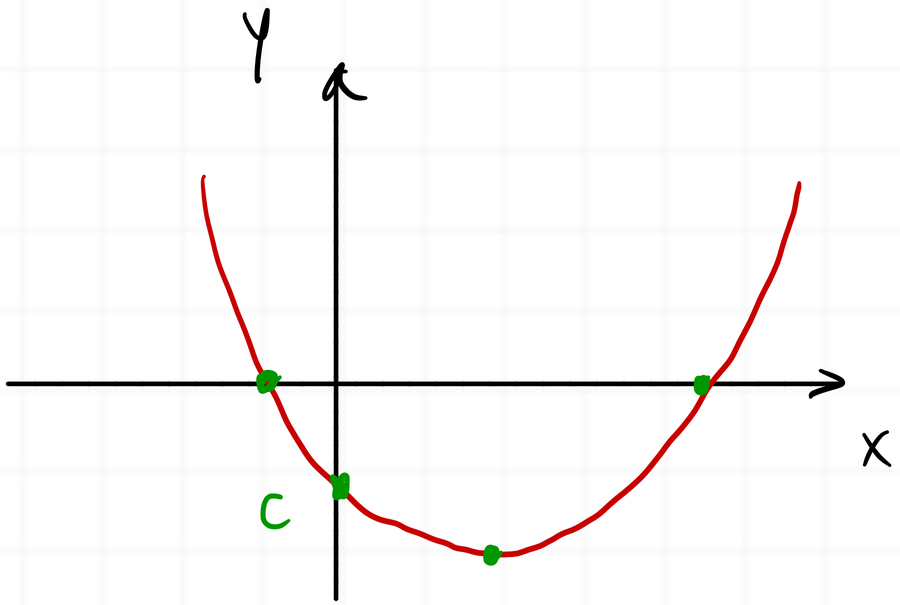
$$y = ax + b$$





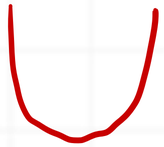
b) FUNÇÃO DO 2º GRAU

$$y = ax^2 + bx + c$$



$$\begin{cases} x_v = \dfrac{-b}{2a} \\ y_v = \dfrac{-\Delta}{4a} \end{cases}$$

$a > 0$

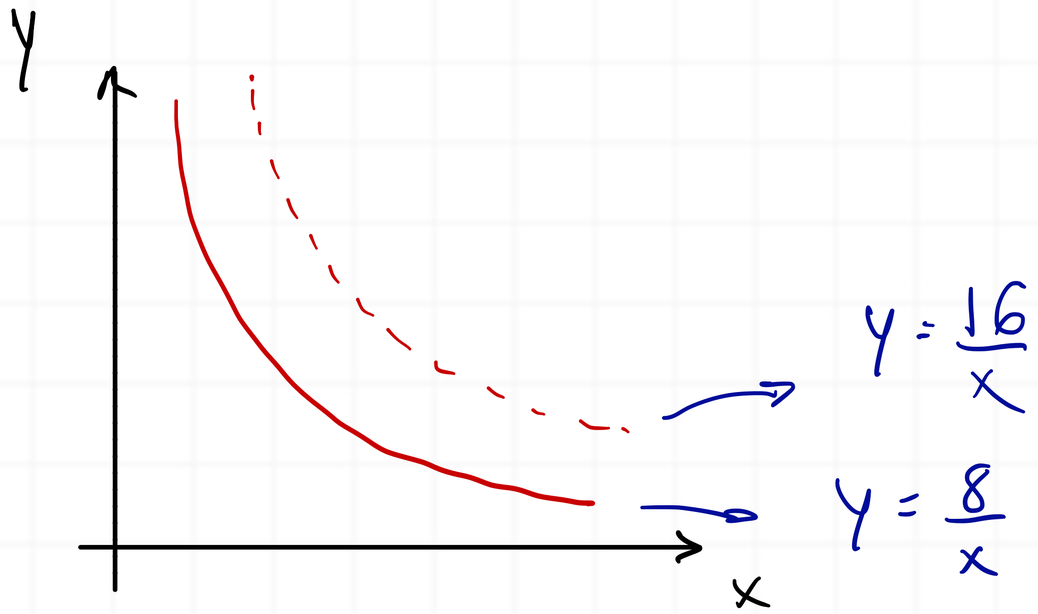


$a < 0$

MODO TURBO | A

c) Função Racional

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



09. Grandezas Físicas

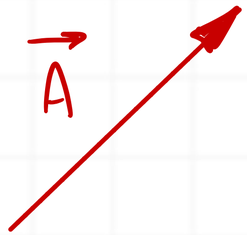
MODO TURBO | A

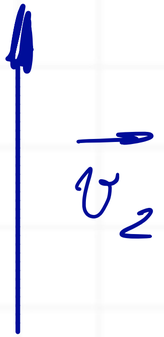
ESCALAR × **VETORIAL**

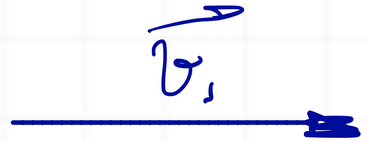
- ESCALAR
  - MÓDULO
- VETORIAL
  - MÓDULO
  - DIREÇÃO
  - SENTIDO

$v_1 = v_2$

$\vec{v_1} \neq \vec{v_2}$



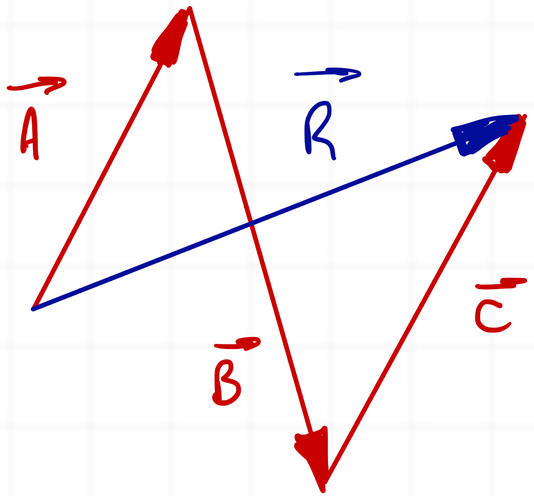


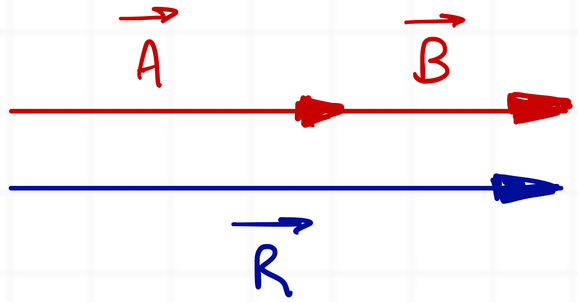


$\vec{v} \neq v$

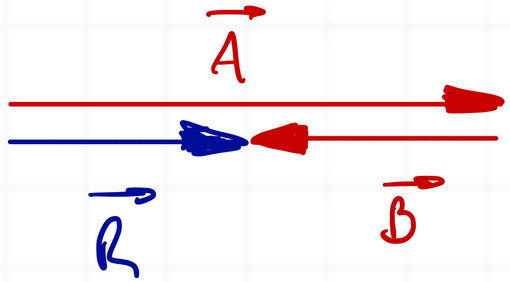
10. Soma Vetorial

A) Regra do Polígono



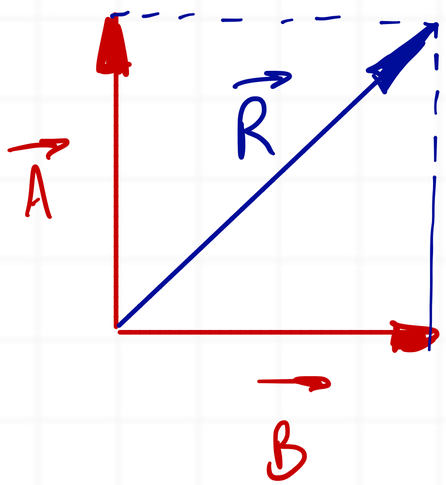


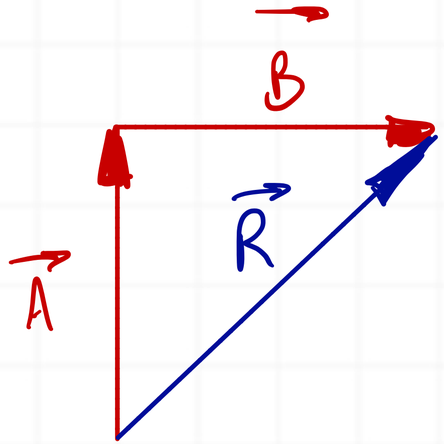
$R = A + B$



$R = A - B$

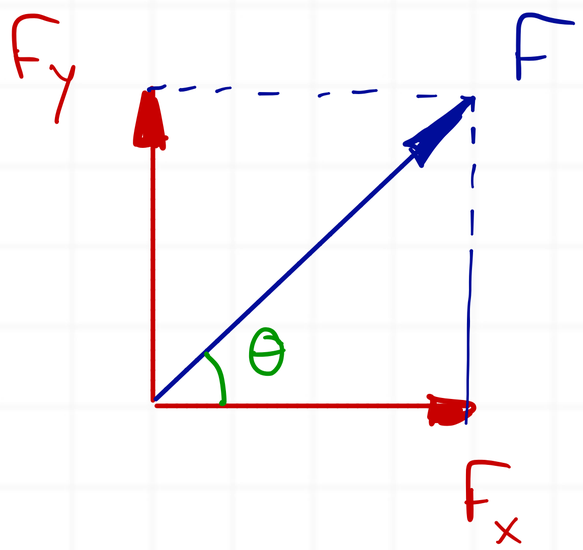
B) Regra do Paralelogramo





$$R^2 = A^2 + B^2$$

11. Decomposição Vetorial



$$\operatorname{sen}\theta = \frac{F_y}{F} \Rightarrow \boxed{F_y = F \cdot \operatorname{sen}\theta}$$

$$\cos\theta = \frac{F_x}{F} \Rightarrow \boxed{F_x = F \cdot \cos\theta}$$

12. Distância x Deslocamento