

Revisión Matemática

Marcos Flores Carrasco

DFI-FCFM

Uchile

Notación científica

Para simplificar la escritura de cantidades altas se utiliza una notación simplificada, denominada notación científica:

$$10^0 = 1$$

$$10^1 = 10$$

$$10^2 = 100$$

...

$$10^{-1} = 0.1$$

$$10^{-2} = 0.01$$

$$10^{-3} = 0.001$$

...

$$10^n 10^m = 10^{n+m}$$

$$10^n 10^{-m} = 10^{n-m}$$

potencias

$$x^n x^m = x^{n+m}$$

$$x^n x^{-m} = x^{n-m}$$

$$x^{1/n} = \sqrt[n]{x}$$

$$(x^n)^m = x^{n*m}$$

Algebra básica

Es importante saber resolver ecuaciones algebraicas de:

Primer orden

$$4x=16 \quad ; \quad x+3=8$$

Segundo orden

$$ax^2 + bx + c = 0$$

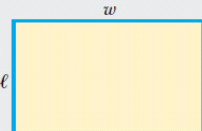
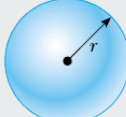
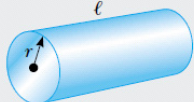
$$x = \frac{-b \pm \sqrt{b^2 - 4ac}}{2a}$$

Geometría

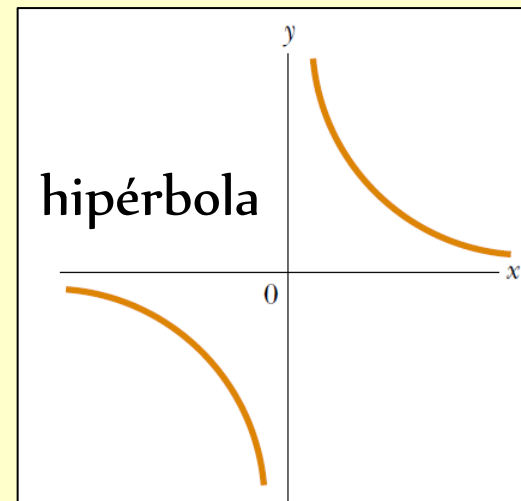
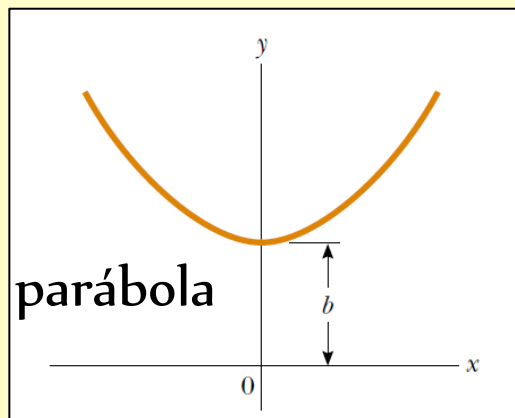
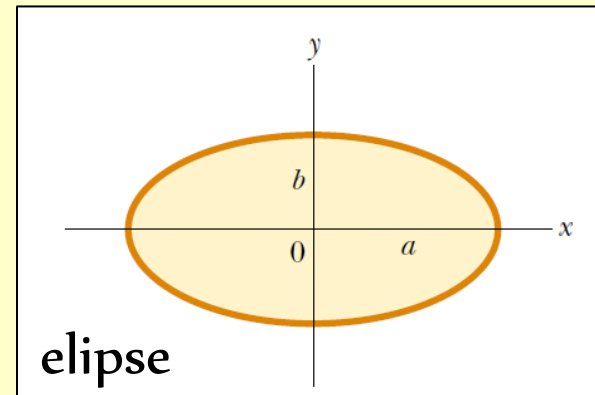
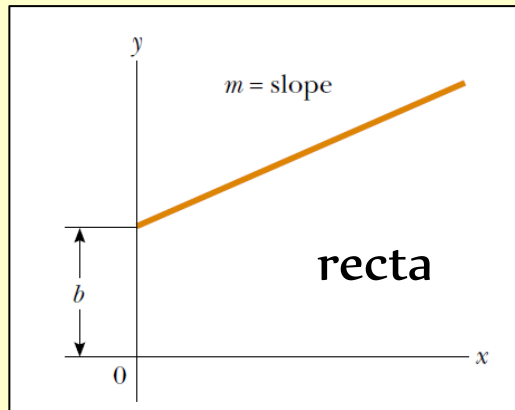
La distancia entre dos puntos en el plano

$$d = \sqrt{(x_2 - x_1)^2 + (y_2 - y_1)^2}$$

También es importante recordar las áreas y volúmenes de algunas figuras geométricas

Shape	Area or Volume	Shape	Area or Volume
 Rectangle	Area = ℓw	 Sphere	Surface area = $4\pi r^2$ Volume = $\frac{4\pi r^3}{3}$
 Circle	Area = πr^2 (Circumference = $2\pi r$)	 Cylinder	Lateral surface area = $2\pi r \ell$ Volume = $\pi r^2 \ell$
 Triangle	Area = $\frac{1}{2}bh$	 Rectangular box	Surface area = $2(\ell h + \ell w + hw)$ Volume = ℓwh

Funciones



Trigonometría

$$\sin \theta = \frac{co}{hip}$$

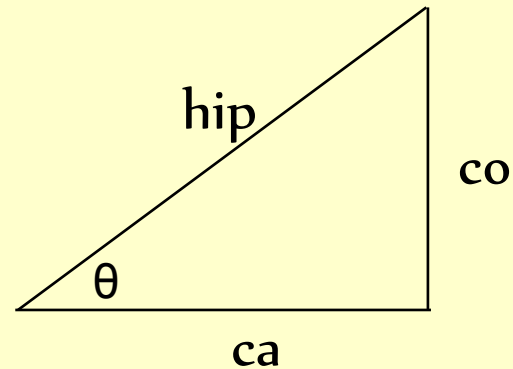
$$\cos \theta = \frac{ca}{hip}$$

$$\tan \theta = \frac{co}{ca}$$

$$\csc \theta = \frac{hip}{co}$$

$$\sec \theta = \frac{hip}{ca}$$

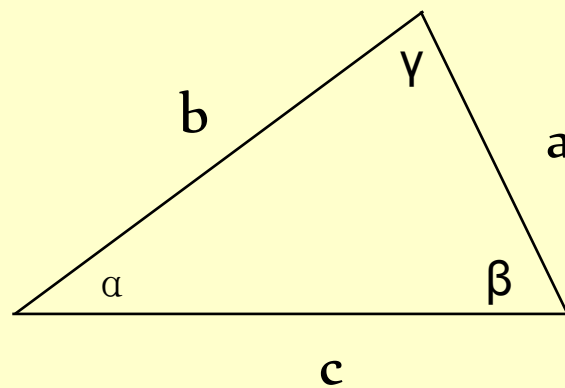
$$\cot \theta = \frac{ca}{co}$$



Trigonometría

Teorema del seno : En un triángulo cualquiera los lados son entre sí como los senos de los ángulos opuestos

$$\frac{a}{\sin \alpha} = \frac{b}{\sin \beta} = \frac{c}{\sin \gamma}$$



Teorema del coseno : (una generalización del teorema de Pitágoras)

$$c^2 = a^2 + b^2 - 2ab \cos \gamma$$

Some Trigonometric Identities

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

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

$$\sin 2\theta = 2 \sin \theta \cos \theta$$

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

$$\tan 2\theta = \frac{2 \tan \theta}{1 - \tan^2 \theta}$$

$$\sin(A \pm B) = \sin A \cos B \pm \cos A \sin B$$

$$\cos(A \pm B) = \cos A \cos B \mp \sin A \sin B$$

$$\sin A \pm \sin B = 2 \sin\left[\frac{1}{2}(A \pm B)\right] \cos\left[\frac{1}{2}(A \mp B)\right]$$

$$\cos A + \cos B = 2 \cos\left[\frac{1}{2}(A + B)\right] \cos\left[\frac{1}{2}(A - B)\right]$$

$$\cos A - \cos B = 2 \sin\left[\frac{1}{2}(A + B)\right] \sin\left[\frac{1}{2}(B - A)\right]$$

$$\csc^2 \theta = 1 + \cot^2 \theta$$

$$\sin^2 \frac{\theta}{2} = \frac{1}{2}(1 - \cos \theta)$$

$$\cos^2 \frac{\theta}{2} = \frac{1}{2}(1 + \cos \theta)$$

$$1 - \cos \theta = 2 \sin^2 \frac{\theta}{2}$$

$$\tan \frac{\theta}{2} = \sqrt{\frac{1 - \cos \theta}{1 + \cos \theta}}$$