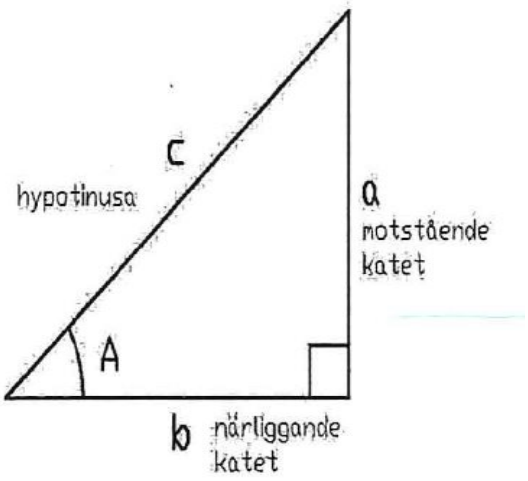
Formelsamling uppdaterad

Trigonometri

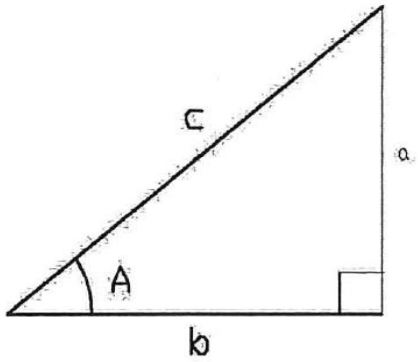


Pytagoras sats:

$C^2 = A^2 + B^2$

Eller c = $\sqrt{a^2 + b^2}$

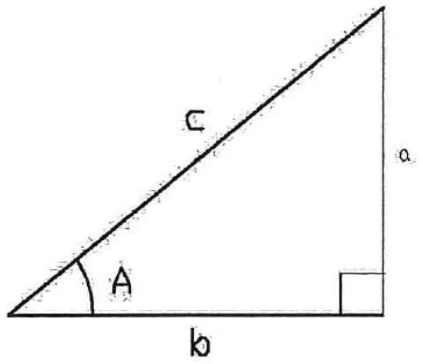
Cosinus



Cos A = $\frac{b}{c}$

C = $\frac{b}{Cos\ A}$ alt. b = C * cos A

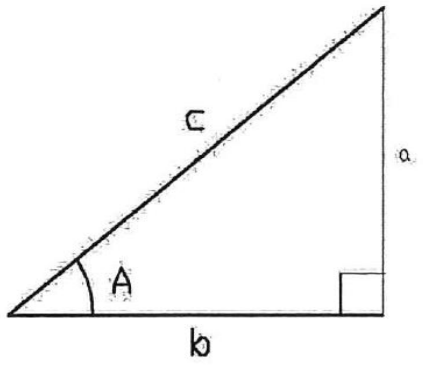
Sinus



Sin A = $\frac{a}{c}$

C = $\frac{a}{Sin\ A}$ alt. a = c * sin A

Tangens



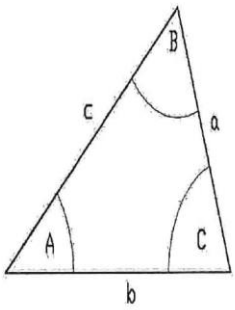
Tan A = $\frac{a}{b}$

A = Tan A * b alt. B = $\frac{a}{Tan\ A}$

Vinkelsumman

$180^0 = \varphi_a + \varphi_b + \varphi_c$

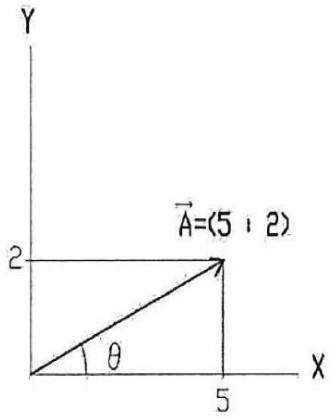
Sinussatsen



$$\frac{a}{Sin\ a} = \frac{b}{Sin\ b} = \frac{c}{Sin\ c}$$

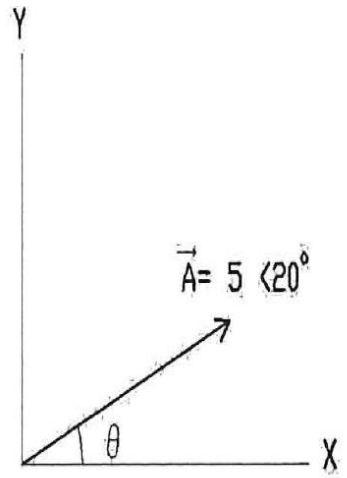
Vektorer

Rektangulär form



A = (5.2) där X= 5 och Y = 2

Polär form



|5| = längd(absolutbelopp) och vinkeln är 20^0 = Q

Omvandling från Rektangulär till Polär form

|A| = $\sqrt{X^2 + Y^2}$

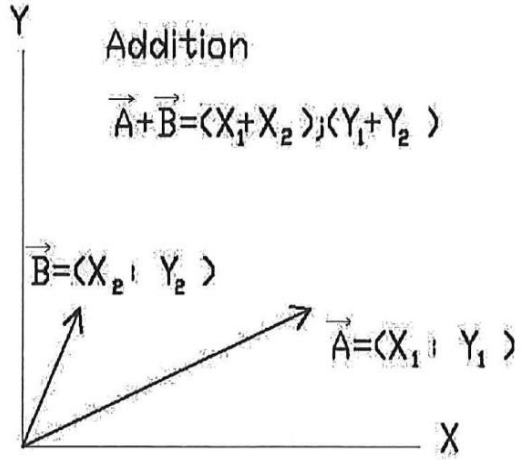
Omvandling från Polär till Rektangulär form

X = |A| * Cos φ

Y = |A| * Sin φ

Addition av Vektorer

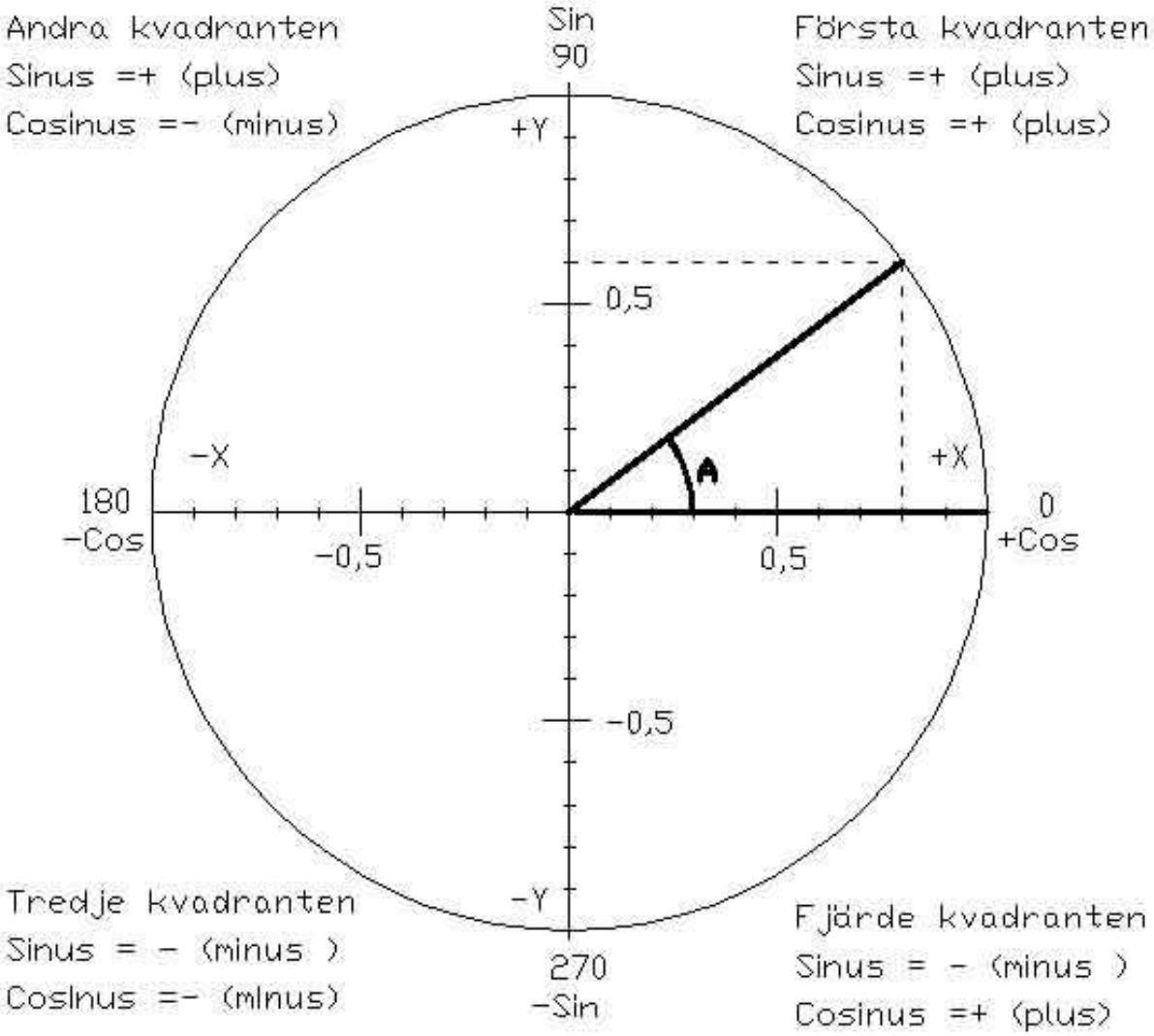
X och Y värdena adderas var för sig



Strömberäkning trefasvektor el

$I_n = \sqrt{I_1^2 + I_2^2 + I_3^2 - I_1 * I_2 - I_1 * I_3 - I_2 * I_3}$

Enhetscirkeln



Mekanik

Dragkraft i stag

$F_S = \frac{Fl*c}{b}$ eller

$F_s = \frac{Fl*\sqrt{a^2+b^2}}{b}$

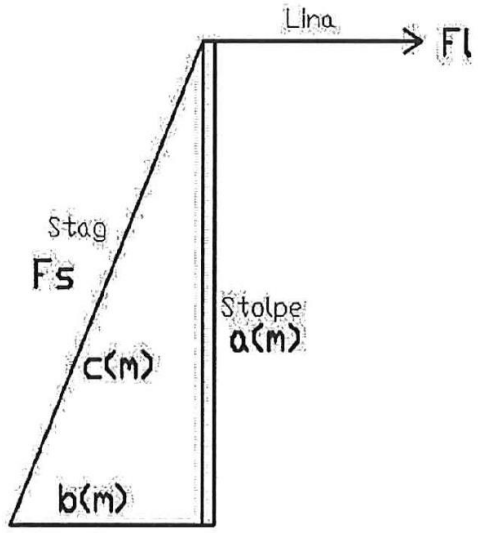
F_s = Drag i stag (N)

Fl = drag i lina (N)

A = stolpens längd (m)

B = avståndet mellan stagfäste och stolprot (m)

C = stagets längd (m)



Utväxlingshastighet

$N_1 * d_1 = n_2 * d_2$

Eller

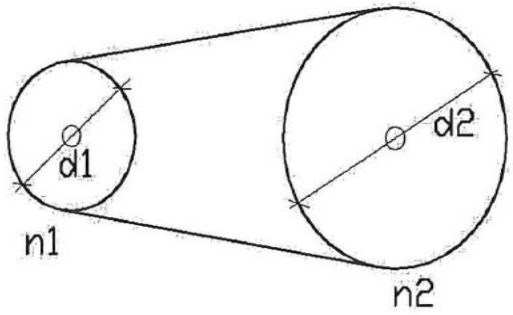
$\frac{n_1}{d_2} = \frac{n_2}{d_1}$

N_1 = Varvtal lilla remskivan

N_2 = Varvtal stora remskivan

D_1 = Diameter lilla remskivan

D_2 = Diameter stora remskivan



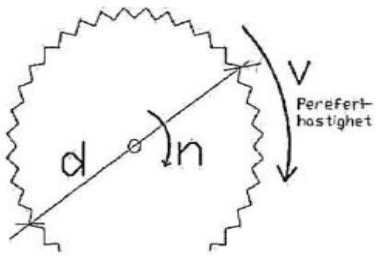
Periferihastighet

$V = d * \pi * \frac{n}{60}$

V = Periferihastighet (m/s)

D= Diameter (m)

N = Varvtal (r/m)



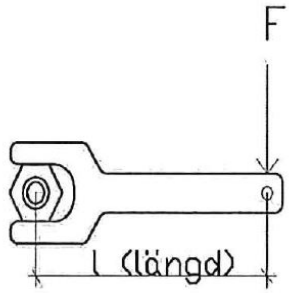
Vridmoment

M = F * l

M = Vridmoment (Nm)

F = Kraft (N)

L= Längd (m)



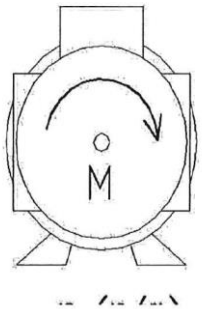
Mekanisk effekt

P = 2 * π * M * $\frac{n}{60}$

P = Effekt (Watt)

M = Vridmoment (Nm)

N = Varvtal (r/m)



Lyft Effekt

P = g * m * v

Eller

P = F * v

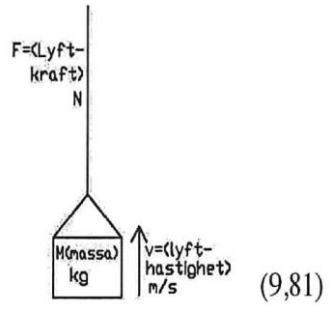
P = Effekt (Watt)

m = massa (kg)

F = lyftkraft (N) (F = m * 9,81)

v = lyfthastighet (m/s)

g = acceleration vid fritt fall



(9,81)

Verkningsgrad

$P_{motor} = \frac{P_{lyft}}{\eta}$

Dynamik – rörelse

Hastighet

S = v * t

S = Sträckan (m)

v = hastigheten (m/s)

t = tiden (s)

Hastighet (vid jämn acceleration)

v = a * t

v = hastighet (m/s)

a = acceleration (m/s^2)

t = tiden (s)

Sträcka (vid jämn acceleration)

$s = \frac{a*t^2}{2}$

s = Sträckan (m)

a = acceleration (m/s^2)

t = tiden (s)

Fritt fall

$s = \frac{g*t^2}{2}$

s = Sträckan (m)

g = gravitationskonstant (9,81)

t = tiden (s)

Rörelseenergi

$W = \frac{m*v^2}{2}$

W = rörelseenergi (Ws = Wattsekund) (J = Joul) (Nm = Newtonmeter)

m = Massa (kg)

v = hastighet (m/s)