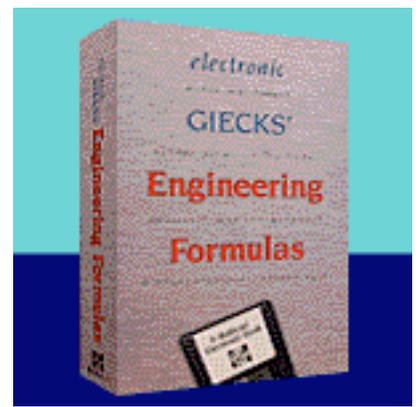


# Electronic Giecks': Engineering Formulas



Platform: Windows

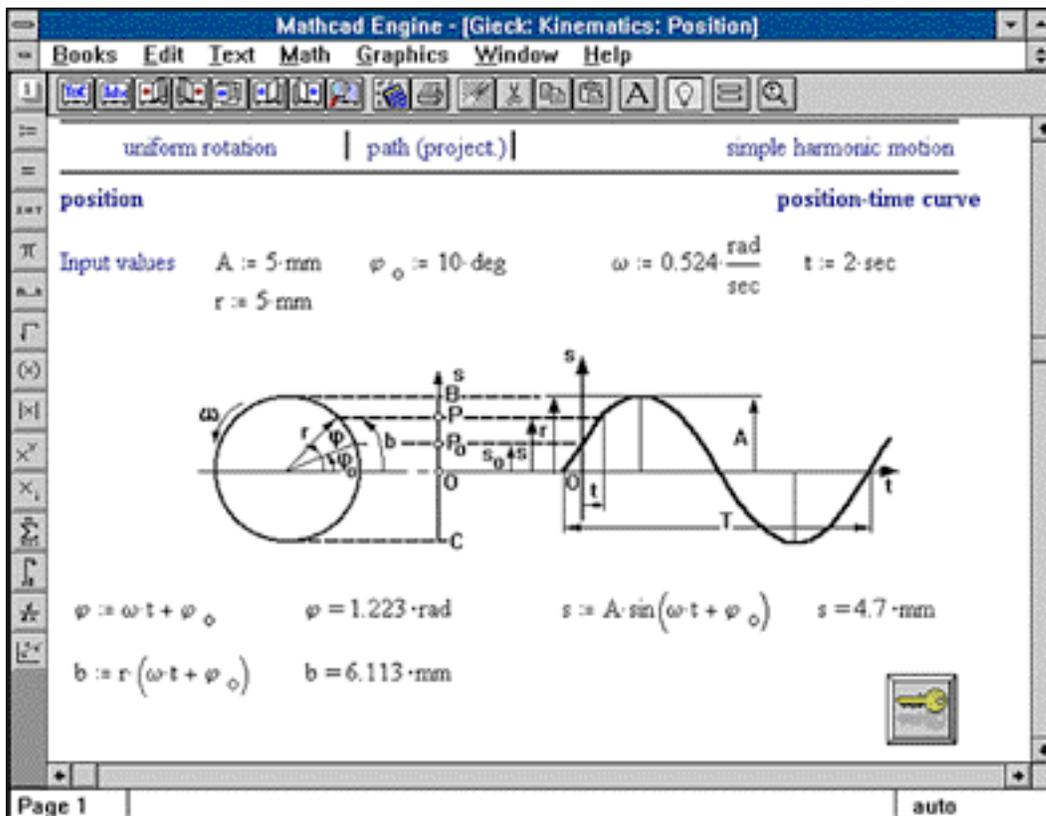
Includes the Mathcad Engine; requires 5 MB hard disk space  
Available for ground shipment

This is an electronic version of McGraw-Hill's well-known *Engineering Formulas, 6th Edition* by Kurt and Reiner Gieck. Designed for students and professionals, this resource uses the Mathcad Engine to present and solve equations using "live" math. When you change a variable Mathcad recalculates the results automatically. You get instant solutions to the more than 300 technical and many of the mathematical problems that have made Giecks' such a classic. Professionals get online access to reference formulas that they can incorporate in their work. Students will use it as an resource, as well as a learning aid for performing calculations and seeing how results change based on different variables.

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*Position-time curve for linear harmonic oscillation of a body supported by a spring.*

Topics include: Units, Areas, Solid Bodies, Arithmetic, Functions of a Circle, Analytical Geometry, Statistics, Differential Calculus, Integral Calculus, Differential Equations, Statics and Kinematics, Dynamics, Hydraulics, Heat, Strength, Machine Parts, Production and Electrical Engineering, Radiation Physics, Chemistry, and more.

# *Electronic Giecks': Engineering Formulas*

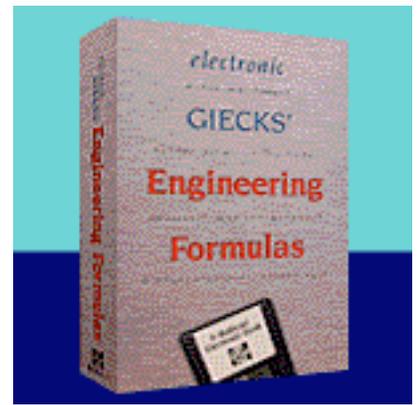
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Rotation  
Energy and torque  
Transmission ratios  
Centrifugal force  
Centrifugal force  
Stresses in rotation bodies  
Harmonic oscillations

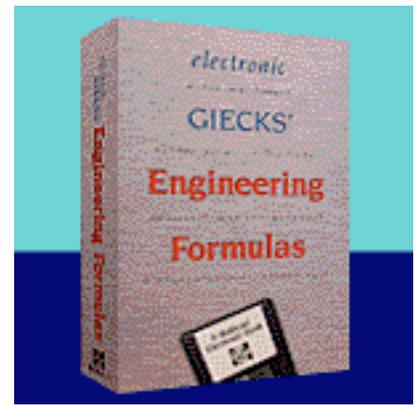


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Mechanical oscillation - Critical speed of shaft  
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Simple pendulum  
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Torsional pendulum  
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Impact-direction and Types of impact  
Coefficient of restitution

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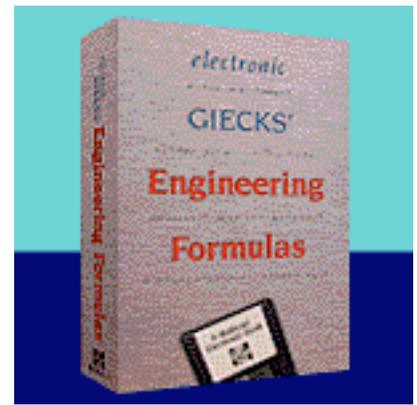
Screws and bolts  
Axles and Shafts  
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- Spur gears, geometry
- Standard gears
- Formulas for dimensions 1
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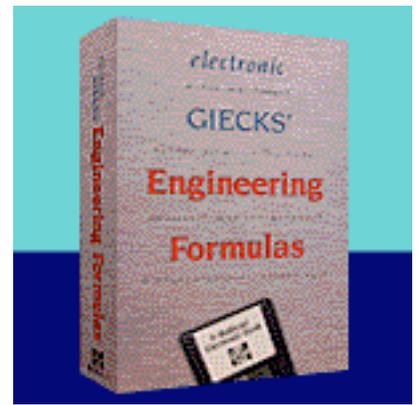
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Calculation of module  
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rustum of cone  
orus  
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pyramid  
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ungula  
frustum of pyramid  
segment of a sphere  
barrel  
cylinder  
sector of a sphere  
prismoid  
hollow cylinder  
sphere with cylindrical boring

### **Hydraulics**

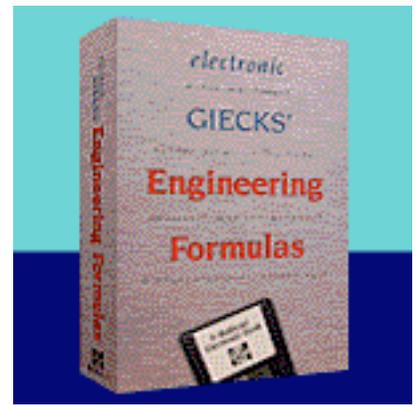
General - Quantities  
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Hydrostatic forces on plane surfaces  
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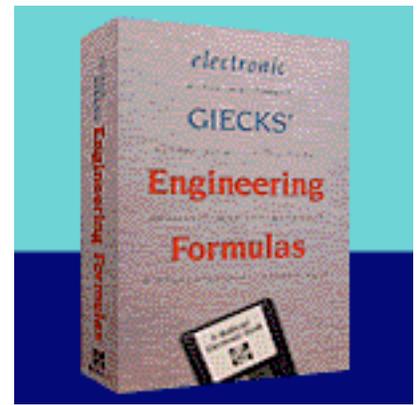
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Free sheave  
Ordinary pully block  
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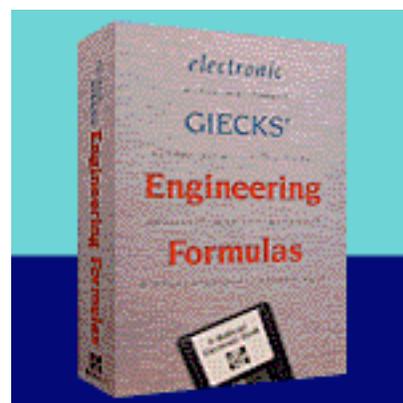
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Electro-magnetic rules

Magnetic field

Quantities of magnetic circuits

Magnetic flux, and Magnetic induction

Inductance, and Magnetic field strength

Magnetomotive force and Reluctance

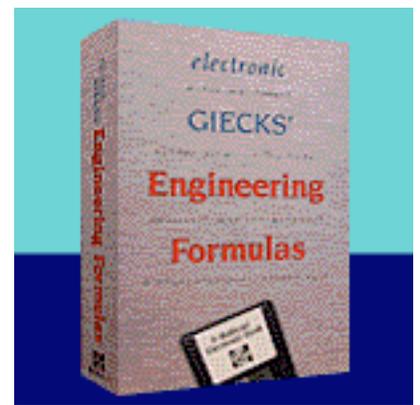
Energy stored in a magnetic field, and Leakage flux

The magnetic field and its forces

Forces acting between magnetic poles

Forces acting on a current-carrying conductor

Induced voltage

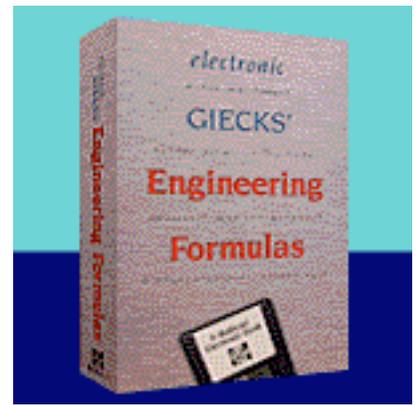


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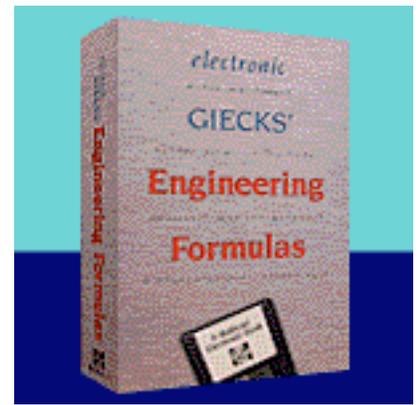
Induced voltage  
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Q factor, damping factor, loss angle  
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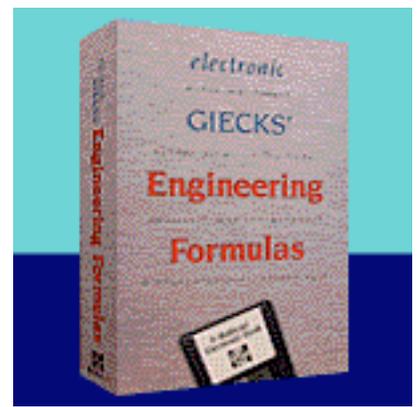
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- Loads
- Tension, Compression
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- Compressive strain under compression
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- Wavelengths
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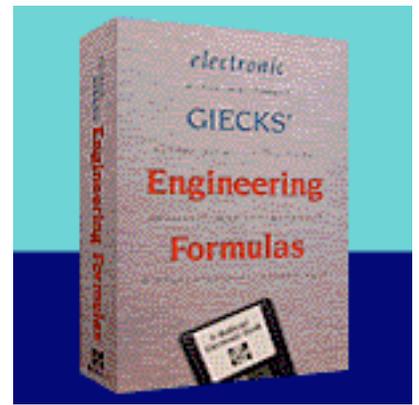


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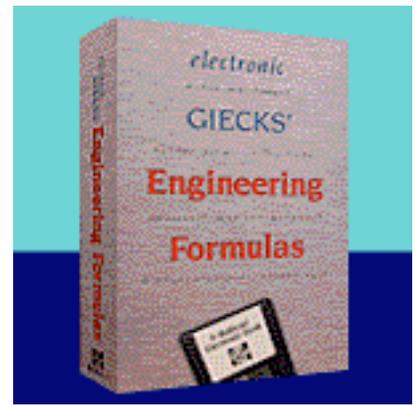
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Magnetic field strength  $H$  and relative permeability  $\mu_r$  as a function of induction  $B$   
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Lighting values  
Guide values for illumination  $E_v$   
Luminous efficacy  $h$   
Luminous flux  $F_v$  of lamps

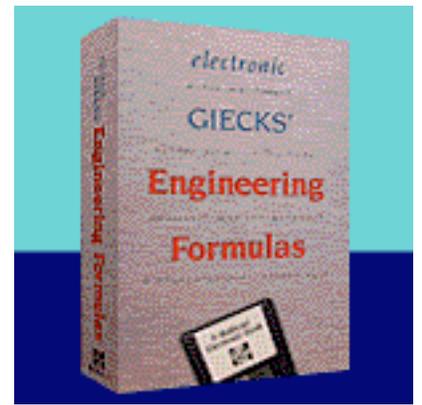
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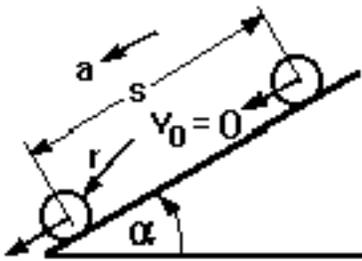
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## Kinematics: Rolling Motion on an Inclined Plane



### Input values

$$r := 20 \cdot \text{mm}$$

$$\mu_o := 0.15$$

$$t := 2 \cdot \text{sec}$$

(assume a ball)

$$k := \sqrt{\frac{2}{5} \cdot r^2}$$

$$f := 0.01 \cdot \text{mm}$$

excluding friction  $f = 0 \dots a_{\text{max}}$

$$\alpha := \text{atan}\left(\mu_o \cdot \frac{r^2 + k^2}{k^2}\right) \quad a := \frac{g \cdot r^2}{r^2 + k^2} \cdot \sin(\alpha) \quad a = 3.256 \cdot \frac{\text{m}}{\text{sec}^2}$$

$$v := a \cdot t \quad v = 6.512 \cdot \frac{\text{m}}{\text{sec}} \quad s := \frac{v^2}{2 \cdot a} \quad s = 6.512 \cdot \text{m}$$

$$v := \sqrt{2 \cdot a \cdot s} \quad v = 6.512 \cdot \frac{\text{m}}{\text{sec}} \quad s := \frac{v \cdot t}{2} \quad s = 6.512 \cdot \text{m}$$

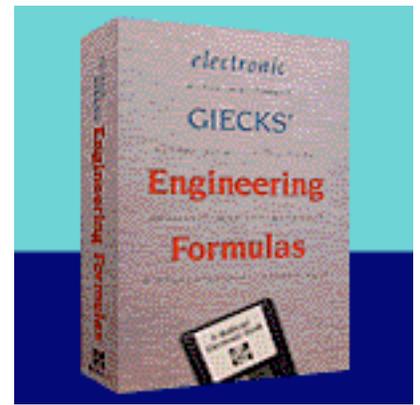
$$v := \frac{2 \cdot s}{t} \quad v = 6.512 \cdot \frac{\text{m}}{\text{sec}} \quad s := \frac{a \cdot t^2}{2} \quad s = 6.512 \cdot \text{m}$$

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including friction  $f > 0$

$$\alpha_{\min} := \operatorname{atan}\left(\frac{f}{r}\right)$$

$$\alpha_{\max} := \operatorname{atan}\left(\mu_o \cdot \frac{r^2 + k^2 + fr}{k^2}\right)$$

$$\alpha := \alpha_{\max}$$

$$a := g \cdot r^2 \cdot \frac{\sin(\alpha) - \frac{f}{r} \cdot \cos(\alpha)}{r^2 + k^2}$$

$$a = 3.254 \cdot \frac{\text{m}}{\text{sec}^2}$$

$$v := a \cdot t \quad v = 6.508 \cdot \frac{\text{m}}{\text{sec}} \quad s := \frac{v^2}{2 \cdot a} \quad s = 6.508 \cdot \text{m}$$

$$v := \sqrt{2 \cdot a \cdot s} \quad v = 6.508 \cdot \frac{\text{m}}{\text{sec}} \quad s := \frac{v \cdot t}{2} \quad s = 6.508 \cdot \text{m}$$

$$v := \frac{2 \cdot s}{t} \quad v = 6.508 \cdot \frac{\text{m}}{\text{sec}} \quad s := \frac{a \cdot t^2}{2} \quad s = 6.508 \cdot \text{m}$$

ball  $k^2 = \frac{2}{5} \cdot r^2$

solid cylinder  $k^2 = \frac{r^2}{2}$

Friction numbers pipe with low wall thickness

$$k^2 = \frac{r_1^2 + r_2^2}{2} \quad \text{approx.} = r^2$$

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