REVOLT: Calculations on road bends
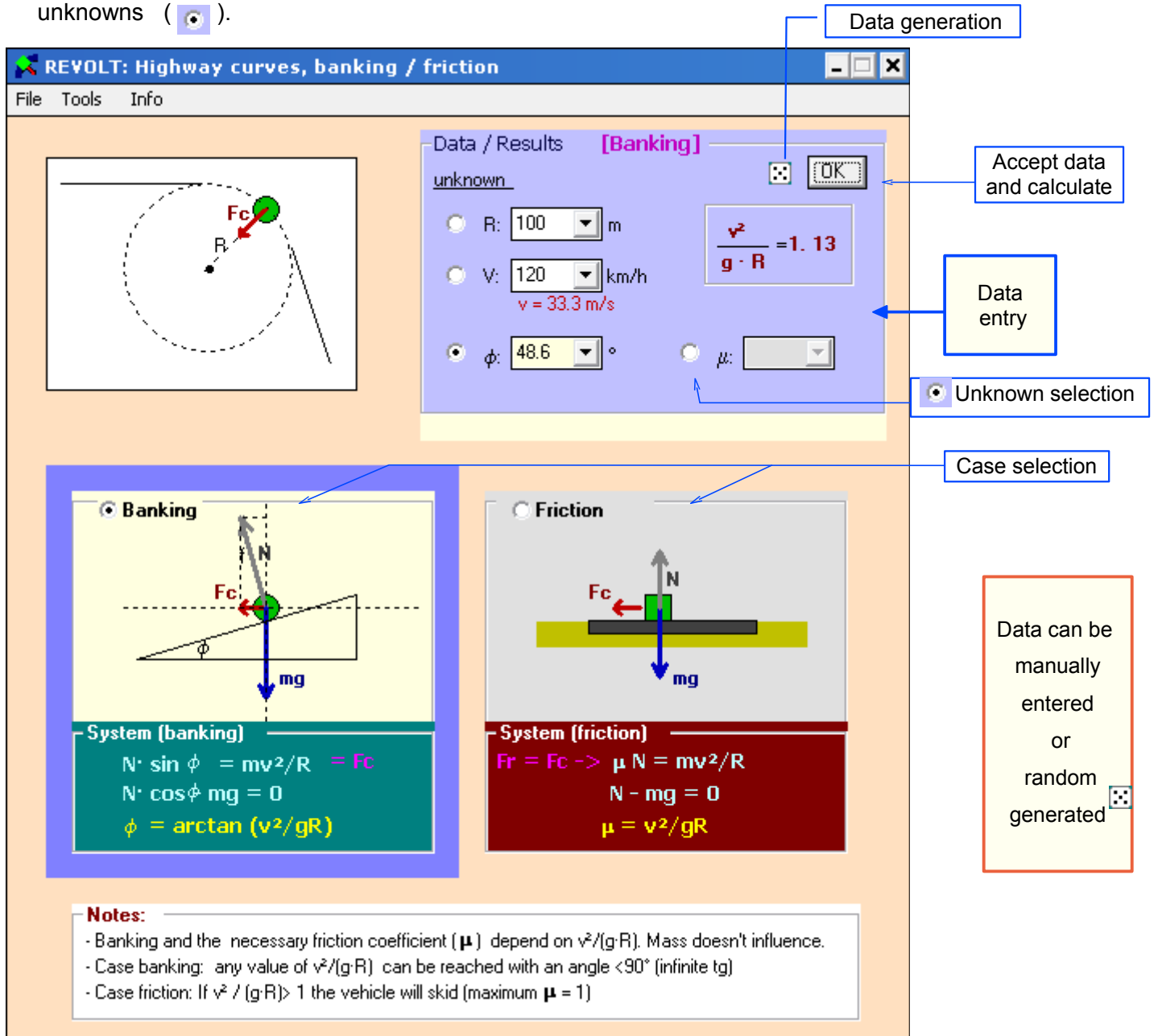
Calculation of parameters for a road bend of curvature radius **R**, in two cases:

a) Banking road: angle banking ϕ required for a certain speed.

b) Road without banking: friction coefficient μ required for a certain speed.

Also, maximum speed or curvature radius can be calculated from other data, marking them as

unknowns   (⊙).

Data generation

Accept data and calculate

Data entry

Unknown selection

Case selection

Data can be manually entered or random generated

REVOLT: Highway curves, banking / friction

File   Tools   Info

Data / Results   [Banking]
unknown

○ R: 100 ▾ m

○ V: 120 ▾ km/h
v = 33.3 m/s

⊙ ϕ: 48.6 ▾ °   ○ μ: ▾

$$\frac{v^2}{g \cdot R} = 1.13$$

⊙ Banking

N
Fc
ϕ
mg

○ Friction

N
Fc
mg

System (banking)

$N \cdot \sin \phi = mv^2/R = Fc$

$N \cdot \cos \phi - mg = 0$

$\phi = \arctan (v^2/gR)$

System (friction)

$Fr = Fc \rightarrow \mu N = mv^2/R$

$N - mg = 0$

$\mu = v^2/gR$

Notes:
- Banking and the necessary friction coefficient (μ) depend on $v^2/(g \cdot R)$. Mass doesn't influence.
- Case banking: any value of $v^2/(g \cdot R)$ can be reached with an angle <90° (infinite tg)
- Case friction: If $v^2 / (g \cdot R)$> 1 the vehicle will skid (maximum $\mu = 1$)

Save / recover results:

By means the menu options:

File   Tools   Info

Save problem

Open

Exit