Predator-Prey Interactions

restart :
with(*DEtools*) :

$sys := \frac{d}{dt}\, x(t) = 0.04 \cdot x(t) - 0.002 \cdot x(t) \cdot y(t),\ \frac{d}{dt}\, y(t) = -0.08 \cdot y(t) + 0.0004 \cdot x(t) \cdot y(t)$;

$$\frac{d}{dt}\, x(t) = 0.04\, x(t) - 0.002\, x(t)\, y(t),\ \frac{d}{dt}\, y(t) = -0.08\, y(t) + 0.0004\, x(t)\, y(t) \quad \textbf{(1.1)}$$

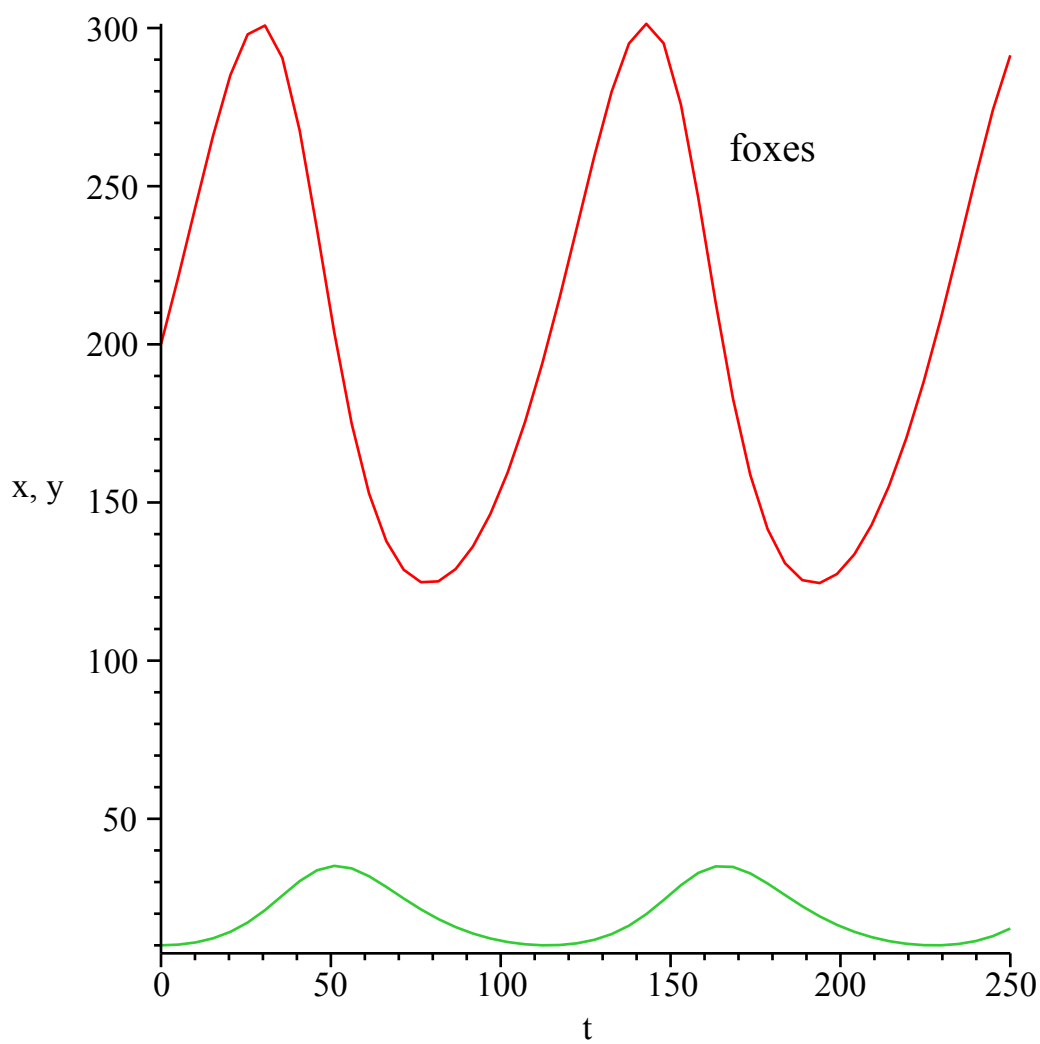
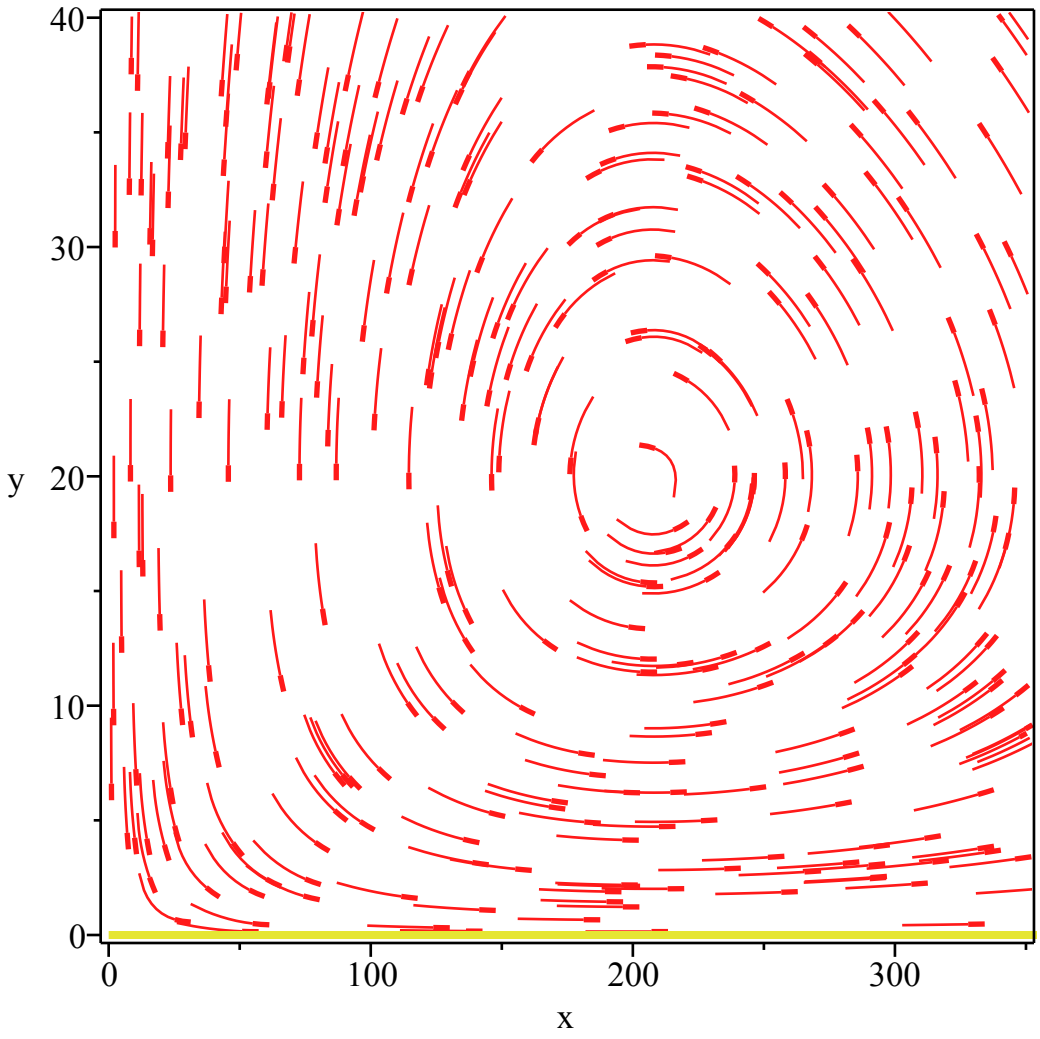
with(*plots*) :

$fcns := \{x(t), y(t)\};\ p := dsolve(\{sys, x(0) = 200, y(0) = 10\}, fcns, type = numeric, method = classical)$

$$\{x(t), y(t)\}$$

proc(*x_classical*) ... **end proc** **(1.2)**

odeplot(*p*, [[*t*, *x*(*t*)], [*t*, *y*(*t*)]], 0 .. 250);



Phase Plane