**7.** $x''_{tt} = xf(y/x), \quad y''_{tt} = yg(y/x).$

A particular periodic solution is given by

$$x = C_1 \sin(kt) + C_2 \cos(kt), \qquad k = \sqrt{-f(\lambda)},$$
$$y = \lambda[C_1 \sin(kt) + C_2 \cos(kt)],$$

where $C_1$ and $C_2$ are arbitrary constants, and $\lambda$ is a root of the transcendental (algebraic) equation

$$f(\lambda) = g(\lambda). \tag{1}$$

2°. Particular solution:

$$x = C_1 \exp(kt) + C_2 \exp(-kt), \qquad k = \sqrt{f(\lambda)},$$
$$y = \lambda[C_1 \exp(kt) + C_2 \exp(-kt)],$$

where $C_1$ and $C_2$ are arbitrary constants, and $\lambda$ is a root of the transcendental (algebraic) equation (1).

 