Math in Moscow, 2014-15 academic year
Ordinary differential equations (http://math-info.hse.ru/s14/12)
Exercises for lesson 8 (04/09/2015)
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Problem 1. Find a solution of the following equation in the form of quasipolynomial $e^{\alpha t}(P_n(t)\sin(\omega t)+Q_(t)\cos(\omega t))$:

$$\ddot{x} + x = \sin t.$$

Is it bounded?

Problem 2. Solve the following equation

(a) $y = x(y' - x\cos x)$;
(b) $(x + y^2)dy = ydx$;