Линейни уравнения 1

В следващите задачи решете уравненията

$$1)\, \ddot{x} - 3\dot{x} + 2x = \sin t.$$

$$2)\, \ddot{x} - 9x = e^{-3t}(t^2 + \sin 3t).$$

$$3)\, \ddot{x} + 4x = \cos t \cos 3t.$$

$$4)\, \ddot{x} + 3\dot{x} + 2x = e^{-t} \cos^2 t.$$

$$5)\, \ddot{x} + x = \frac{1}{\cos t}.$$

$$6)\, \ddot{x} + 2\dot{x} + x = 3e^{-t}\sqrt{1+t}.$$

$$7)\, \ddot{x} - 6\dot{x} + 9x = \frac{e^{3t}}{t^2}.$$

$$8)\, \ddot{x} + 4x = 2\,\mathrm{tg}t.$$

$$9)\, \ddot{x} + 2\dot{x} + x = te^t + \frac{1}{te^t}.$$