Wyznaczyć rozwiązanie ogólne równania

$$a_2(t)y'' + a_1(t)y' + a_0(t)y = 0$$

jeżeli $y_1$ jest rozwiązaniem tego równania .

**Zadanie 1**
$y'' + \frac{2t}{t^2-1}y' - \frac{2}{t^2-1}y = 0, \quad y_1(t) = t$

**Zadanie 2**
$y'' + \frac{1-2t}{t}y' + \frac{t-1}{t}y = 0, \quad y_1(t) = e^t$

**Zadanie 3**
$t^3y'' - ty' + y = 0, \quad y_1(t) = t$

**Zadanie 4**
$t^2y'' + ty' + (t^2 - \frac{1}{4})y = 0, \quad y_1(t) = \frac{\sin t}{\sqrt{t}}$

**Zadanie 5**
$ty'' + y' = 0, \quad y_1(t) = \ln t$

**Zadanie 6**
$4t^2y'' + y = 0, \quad y_1(t) = \sqrt{t}\ln t$

**Zadanie 7**
$(1 - 2t - t^2)y'' + 2(1 + t)y' - 2y = 0, \quad y_1(t) = t + 1$

**Zadanie 8**
$(1 - t^2)y'' - 2ty' = 0, \quad y_1(t) = 1$

**Zadanie 9**
$(1 + 2t)y'' + 4ty' - 4y = 0, \quad y_1(t) = e^{-2t}$

**Zadanie 10**
$(1 + t)y'' + ty' - y = 0, \quad y_1(t) = t$

**Zadanie 11**
$t^2y'' - 20y = 0, \quad y_1(t) = \frac{1}{t^4}$

**Zadanie 12**
$(3t + 1)y'' - (9t + 6)y' + 9y = 0, \quad y_1(t) = e^{3t}$

**Zadanie 13**
$ty'' - (t + 1)y' + y = 0, \quad y_1(t) = e^t$

**Zadanie 14**
$y'' - 3(\operatorname{tg} t)y' = 0, \quad y_1(t) = 1$

**Zadanie 15**
$ty'' - (2+t)y' = 0, \quad y_1(t) = 1$

**Zadanie 16**
$t^2(t+1)y'' - 2y = 0, \quad y_1(t) = 1 + \dfrac{1}{t}$

**Zadanie 17**
$ty'' + 2y' - ty = 0, \quad y_1(t) = \dfrac{e^t}{t}$

**Zadanie 18**
$y'' - 2(1 + \operatorname{tg}^2 t)y = 0, \quad y_1(t) = \operatorname{tg} t$

**Zadanie 19**
$(e^t + 1)y'' - 2y' - e^t y = 0, \quad y_1(t) = e^t - 1$

Wyznaczyć rozwiązanie ogólne równania Eulera

**Zadanie 20**
$t^3y''' + ty' - y = 4t \ln t$

**Zadanie 21**
$t^3y''' - t^2y'' + 2ty' - 2y = t^3$

**Zadanie 22**
$t^2y'' - 7ty' - 20y = t + 1$

**Zadanie 23**
$t^2y'' - 5ty' + 9y = 2 - t$

**Zadanie 24**
$t^2y'' - 6ty' + 6y = t + 2t^4$

**Zadanie 25**
$y^2y'' + ty' + y = t^2 + 1$

**Zadanie 26**
$t^2y'' - 4ty' + 6y = 2t - 1$

**Zadanie 27**
$t^3y''' - 3t^2y'' + 6ty' - 6y = \sqrt{t}$

**Zadanie 28**
$t^2y'' - ty' + 2y = t^2 + t$

**Zadanie 29**
$t^2y'' - 3ty' + 5y = 1 - t^2$

**Zadanie 30**
$t^2y'' - 7ty' + 16y = 2t + t^2$

**Zadanie 31**
$t^2y'' + 2ty' - 6y = 0$

**Zadanie 32**
$t^2y'' - 3ty' + 4y = t^3$

**Zadanie 33**
$t^3y''' - t^2y'' + 2ty' - 2y = t^3$

**Zadanie 34**
$t^2y'' - ty' + y = 8t^3$

**Zadanie 35**
$t^2y'' + ty' + 4y = 10t$

**Zadanie 36**
$t^3y'' - 2ty = 6\ln t$

**Zadanie 37**
$t^2y'' - 3ty' + 5y = 3t^2$

**Zadanie 38**
$t^2y'' - 6y = 5t^3 + 8t^2$

**Zadanie 39**
$t^2y'' - 2y = \sin(\ln t)$

**Zadanie 40**
$(t-2)^2y'' - 3(t-2)y' + 4y = t$

**Zadanie 41**
$y'' - \dfrac{2y}{t^2} = 3\ln(-t)$

**Zadanie 42**
$t^2y'' - 2y = \dfrac{3t^2}{t+1}$

**Zadanie 43**
$t^2y'' - ty' + y = \dfrac{\ln t}{t} + \dfrac{t}{\ln t}$

**Zadanie 44**
$t^2y'' - 3ty' + 3y = 2t^4e^t$

**Zadanie 45**
$ty'' + y = t$

**Zadanie 46**
$ty'' - 4y' = t^4$

**Zadanie 47**
$2t^2y'' + 5ty' + y = t^2 - t$

**Zadanie 48**
$t^2y'' - ty' + y = 2t$

**Zadanie 49**
$t^2y'' - 2ty' + 2y = t^4e^t$

**Zadanie 50**
$t^2y'' - ty + y = \ln t$

**Zadanie 51**
$t^2y'' + 10ty' + 8y = t^2$

**Zadanie 52**
$t^2y'' - 4ty' + 6y = \ln(t^2)$

**Zadanie 53**
$t^2y'' - 3ty' + 13y = 4 + 3t$

**Zadanie 54**
$2t^2y'' - 3ty' - 3y = 1 + 2t + t^2$

**Zadanie 55**
$t^3y''' - 3t^2y'' + 6ty' - 6y = 3 + \ln(t^3)$