

Ülesanded 14.20–14.35 leida antud lineaarse homogeense võrrandi üldlahend, kui on teada tema üks erilahend y_1 . Nendes ülesannetes, kus erilahendit pole antud, võib erilahendi leida võrrandi kujust lähtudes, otsides teda eksponentfunktsiooni $y_1 = e^{ax}$ või polünoomi $y_1 = x^n + ax^{n-1} + bx^{n-2} + \dots$ kujul.

- 14.20. $(2x+1)y'' + 4xy' - 4y = 0$.
 14.21. $x(x-1)y'' - xy' + y = 0$.
 14.22. $x^2y'' \ln x - xy' + y = 0$.
 14.23. $xy'' - (2x+1)y' + 2y = 0$.
 14.24. $(x^2+1)y'' - 2y = 0$.
 14.25. $(x^2+1)y'' + xy' - y = 0$.
 14.26. $xy'' - (x+1)y' - 2(x-1)y = 0$.
 14.27. $y'' + \frac{2}{x}y' + y = 0$, $y_1 = \frac{\sin x}{x}$.
 14.28. $xy'' + 2y' - xy = 0$, $y_1 = e^{x^2/x}$.
 14.29. $y'' - 2(1+\tan^2 x)y = 0$, $y_1 = \tan x$.
 14.30. $(e^x+1)y'' - 2y' - e^{2x}y = 0$, $y_1 = e^x - 1$.
 14.31. $y'' + y'(\tan x) - y \cos^2 x = 0$, $y_1 = e^{\sin x}$.
 14.32. $y'' + (\tan x - 2\cot x)y' + 2y(\cot x)^2 = 0$, $y_1 = \sin x$.
 14.33. $y'' - \frac{2y}{\cos^3 x} = 0$, $y_1 = \tan x$.
 14.34. $x^2y'' - 2xy' + (4x^2+2)y = 0$, $y_1 = x \cos 2x$.
 14.35. $y'' + y'(\tan x) + y \cos^2 x = 0$, $y_1 = \cos(\sin x)$.

Ülesanded 14.36–14.39 leida antud lineaarse mittehomogeense võrrandi üldlahend, kui on teada temale vastava homogeense võrrandi üks erilahend y_1 .

- 14.36. $y'' + y' + e^{-2x}y = e^{-3x}$, $y_1 = \cos e^{-x}$.
 14.37. $y'' - y' + e^{2x}y = xe^{2x} - 1$, $y_1 = \sin e^x$.
 14.38. $y'' + \frac{2}{x}y' + y = \frac{1}{x}$, $y_1 = \frac{\sin x}{x}$.
 14.39. $x^2y'' - xy' - 3y = 5x^4$, $y_1 = 1/x$.

Lahendada lineaarsed mittehomogeensed diferentsiaalvõrrandid 14.40–14.45.

- 14.40. $xy'' - (1+2x^2)y' = 4x^3e^{x^2}$.
 14.41. $y'' - 2y'\tan x = 1$.
 14.42. $y''x(\ln x) - y' = \ln^2 x$.
 14.43. $xy'' + (2x-1)y' = -4x^2$.
 14.44. $y'' + y'\tan x = (\cos x) \cdot (\cot x)$.
 14.45. $(2x+1)y'' + (2x-1)y' - 2y = x^2 + x$.

Ülesanded 1241–1255 leida diferentsiaalvõrrandi üldlahend.

1241. $y'' = x^2 + \ln x$.
 1242. $x \frac{d^2y}{dx^2} = 1 + x^2$.
 1243. $y'' = x + \arctan x$.
 1244. $y'' = x + \sin x$.
 1245. $y'' = \ln x$.
 1246. $x^2y'' = y'^2$.
 1247. $(1+x) \frac{d^2y}{dx^2} + \frac{dy}{dx} = 0$.
 1248. $xy'' + y' - 4x = 0$.
 1249. $x^2y'' + xy' = 1$.
 1250. $(1+x^2) \frac{d^2y}{dx^2} + \left(\frac{dy}{dx}\right)^2 + 1 = 0$.
 1251. $y \frac{d^2y}{dx^2} = y^2 \frac{dy}{dx} + \left(\frac{dy}{dx}\right)^2$.
 1252. $y'' \tan y - 2y'^2 = 0$.
 1253. $yy'' + y'^2 = y'$.
 1254. $y \frac{d^2y}{dx^2} = 1 + \left(\frac{dy}{dx}\right)^2$.
 1255. $(1-y)y'' + 2y'^2 = 0$.

Ülesanded 1256–1270 leida teist järku lineaarse konstantsete kordajatega homogeense diferentsiaalvõrrandi üldlahend.

1256. $y'' - 7y' + 12y = 0$.
 1257. $2y'' + 3y' = 2y$.
 1258. $y'' - 7y' = 0$.
 1259. $3y'' - 4y' = 0$.
 1260. $y'' = 4y' + y$.
 1261. $y'' + \frac{1}{2}y' + \frac{1}{16}y = 0$.
 1262. $9y'' - 6y' + y = 0$.
 1263. $36y'' - 12y' + y = 0$.
 1264. $y'' - 6y' + 9y = 0$.
 1265. $4y'' + 4y' + y = 0$.
 1266. $y'' + 9y = 0$.
 1267. $y'' + 7y' + 17y = 0$.
 1268. $2y'' + 5y = 0$.
 1269. $2y'' + 4y' + 5y = 0$.
 1270. $y'' = 8y' - 25y$.

Ülesanded 1271–1275 leida diferentsiaalvõrrandi erilahend, mis rahuldab algingimusi.

1271. $3y'' = 5y'$, $y(0) = 2$, $y'(0) = \frac{5}{3}$.
 1272. $3y'' - y' = 0$, $y(3) = 1$, $y'(3) = \frac{1}{3}$.
 1273. $y'' - 6y' + 9y = 0$, $y(1) = 0$, $y'(1) = e^3$.
 1274. $y'' = 2(3y' - 5y)$, $y(0) = 1$, $y'(0) = 4$.
 1275. $y'' = 5y - 4y'$, $y(-1) = 0$, $y'(-1) = 1$.

Integreerida järgmised lihtsamad teist järku diferentsiaalvõrrandid, mis taanduvad esimest järku võrrandideks.

118. $xy'' = 2$. Vast. $y = x^2 \ln x + C_1x^2 + C_2x + C_3$; leida algingimusi $x = 1$; $y = 1$; $y' = 1$; $y'' = 3$ rahuldav erilahend.
 119. $y^{(n)} = x^m$. Vast. $y = \frac{mx^{m+n}}{(m+n)!} + C_1x^{n-1} + \dots + C_{n-1}x + C_n$.
 120. $y'' = a^2y$. Vast. $ax = \ln(ay + \sqrt{a^2y^2 + C_1}) + C_2$ ehk $y = C_1e^{ax} + C_2e^{-ax}$.
 121. $y'' = \frac{a}{y^3}$. Vast. $(C_1x + C_2)^2 = C_1y^2 - a$.
 Näidetes 122–125 leida algingimustele $x = 0$, $y = -1$; $y' = 0$ vastav erilahend.
 122. $xy'' - y' = x^2e^x$. Vast. $y = e^x(x-1) + C_1x^2 + C_2$. Erilahend: $y = e^x(x-1)$.
 123. $yy'' - (y')^2 + (y')^3 = 0$. Vast. $y + C_1 \ln y = x + C_2$. Erilahend: $y = -1$.
 124. $y'' + y' \tan x = \sin 2x$. Vast. $y = C_2 + C_1 \sin x - x - \frac{1}{2} \sin 2x$. Erilahend: $y = 2 \sin x - \sin x \cos x - x - 1$.
 125. $(y'')^2 + (y')^2 = a^2$. Vast. $y = C_2 - a \cos(x + C_1)$. Erilahendid: $y = a - 1 - a \cos x$; $y = a \cos x - (a+1)$. (Näpunäide. Parameetritiline kuju on $y'' = a \cos t$, $y' = a \sin t$.)
 126. $y'' = \frac{1}{2y}$. Vast. $y = \pm \frac{2}{3}(x + C_1)^{\frac{3}{2}} + C_2$.
 127. $y'' = y'^2$. Vast. $y \frac{d}{dx}(C_1 - x)[\ln(C_1 - x) - 1] + C_2x + C_3$.
 128. $y'y''' - 3y'^2 = 0$. Vast. $x = C_1y^2 + C_2y + C_3$.

Integreerida järgmised konstantsete kordajatega lineaarsed diferentsiaalvõrrandid.

129. $y'' = 9y$. Vast. $y = C_1e^{3x} + C_2e^{-3x}$.
 130. $y'' + y = 0$. Vast. $y = A \cos x + B \sin x$.
 131. $y'' - y' = 0$. Vast. $y = C_1 + C_2e^x$.
 132. $y'' + 12y = 7y'$. Vast. $y = C_1e^{3x} + C_2e^{4x}$.
 133. $y'' - 4y' + 4y = 0$. Vast. $y = (C_1 + C_2x)e^{2x}$.
 134. $y'' + 2y' + 10y = 0$. Vast. $y = e^x(C_1 \cos 3x + B \sin 3x)$.
 135. $y'' + 3y' - 2y = 0$. Vast. $y = C_1e^{\frac{-3+\sqrt{17}}{2}x} + C_2e^{\frac{-3-\sqrt{17}}{2}x}$.
 136. $4y'' - 12y' + 9y = 0$. Vast. $y = (C_1 + C_2x)e^{\frac{3}{2}x}$.
 137. $y'' + y' + y = 0$. Vast. $y = e^{-\frac{1}{2}x} \left[A \cos\left(\frac{\sqrt{3}}{2}x\right) + B \sin\left(\frac{\sqrt{3}}{2}x\right) \right]$.
 140. $y^{IV} - 5y'' + 4y = 0$. Vast. $y = C_1e^x + C_2e^{-x} + C_3e^{2x} + C_4e^{-2x}$.
 141. $y''' - 2y'' - y' + 2y = 0$. Vast. $y = C_1e^{2x} + C_2e^x + C_3e^{-x}$.
 142. $y''' - 3ay'' + 3a^2y' - a^3y = 0$. Vast. $y = (C_1 + C_2x + C_3x^2)e^{ax}$.
 143. $y^V - 4y'' = 0$. Vast. $y = C_1 + C_2x + C_3x^2 + C_4e^{2x} + C_5e^{-2x}$.
 144. $y^{IV} - 2y'' + 9y = 0$. Vast. $y = (C_1 \cos \sqrt{2}x + C_2 \sin \sqrt{2}x)e^{-x} + (C_3 \cos \sqrt{2}x + C_4 \sin \sqrt{2}x)e^x$.
 145. $y^{IV} - 8y'' + 16y = 0$. Vast. $y = C_1e^{2x} + C_2e^{-2x} + C_3xe^{2x} + C_4xe^{-2x}$.
 146. $y^{IV} + y = 0$. Vast. $y = e^{\frac{x}{\sqrt{2}}} \left(C_1 \cos \frac{x}{\sqrt{2}} + C_2 \sin \frac{x}{\sqrt{2}} \right) + e^{-\frac{x}{\sqrt{2}}} \left(C_3 \cos \frac{x}{\sqrt{2}} + C_4 \sin \frac{x}{\sqrt{2}} \right)$.
 147. $y^{IV} - a^4y = 0$. Leida üldlahend ja see erilahend, mis rahuldab algingimusi $y = 1$, $y' = 0$, $y'' = -a^2$, $y''' = 0$, kui $x_0 = 0$. Vast. Üldlahend $y = C_1e^{ax} + C_2e^{-ax} + C_3 \cos ax + C_4 \sin ax$. Erilahend: $y_0 = \cos ax$.

Ülesanded 1276–1295 leida teist järku lineaarse konstantsete kordajatega mittehomogeense diferentsiaalvõrrandi üldlahend.

1276. $y'' - 7y' + 12y = x$.
 1277. $y'' + y' = 8x^3 + 24x^2 - 10x$.
 1278. $y'' - 3y' + 9x^2 + 6x - 13 = 0$.
 1279. $y'' - 4y' - 5y = x^3 + 1$.
 1280. $\frac{d^2y}{dx^2} + 4y = 2x + 3$.
 1281. $\frac{d^2y}{dx^2} - \frac{dy}{dx} - 2y = 4e^{2x}$.
 1282. $\frac{d^2y}{dx^2} + 2\frac{dy}{dx} + y = 3e^{-x}$.
 1283. $y'' - 2y' - 3y = e^{-x}$.
 1284. $y'' - 6y' + 13y = e^{-2x}$.
 1285. $y'' + 3y' + 2y = 6e^{-5x}$.
 1286. $7\frac{d^2y}{dx^2} + 6\frac{dy}{dx} + 5y = x \sin x$.
 1287. $y'' - 7y' + 6y = \sin x$.
 1288. $\frac{d^2y}{dx^2} + 4\frac{dy}{dx} - y = \sin x$.
 1289. $y'' + 2y' + 5y = 2x \sin 2x$.
 1290. $\frac{d^2y}{dx^2} + 9y = \sin 3x$.
 1291. $\frac{d^2y}{dx^2} + y = 2x^3 - x + 2 + \cos x$.
 1292. $y'' - 2y' + y = 1 + x + 2(3x^2 - 2)e^x$.
 1293. $\frac{d^2y}{dx^2} + 4\frac{dy}{dx} + 3y = x + e^{2x}$.
 1294. $\frac{d^2y}{dx^2} + 3y = \sin x + \frac{1}{3} \sin 3x$.
 1295. $\frac{d^2y}{dx^2} + \frac{dy}{dx} - 2y = x^2e^{4x} + 2e^x$.

Ülesanded 1296–1300 leida diferentsiaalvõrrandi üldlahend konstantide varieerimise meetodi abil.

1296. $y'' + 4y' + 4y = \frac{e^{-2x}}{x^3}$.
 1297. $y'' + y = \frac{1}{\cos x}$.
 1298. $y'' - y' = \frac{e^x}{3 - e^x}$.
 1299. $y'' + y = \tan x$.
 1300. $y'' - 2y' + y = \frac{e^x}{x^2 + 1}$.

Ülesanded 1301–1305 leida kõrgemat järku lineaarse konstantsete kordajatega diferentsiaalvõrrandi üldlahend.

1301. $y''' - 7y'' + 6y' = \sin x$.
 1302. $y''' + 6y'' + 11y' + 6y = 6x^3 + 2x^2 + 1$.
 1303. $y''' - y'' = x + 1$.
 1304. $y^{IV} - 4y = e^x$.
 1305. $y''' + y'' = x^2$.

- 14.20. $y = C_1x + C_2e^{-2x}$.
 14.21. $y = C_1(1+x \ln x) + C_2e^{2x}$.
 14.22. $y = C_1x + C_2e^{2x}$.
 14.23. $y = C_1(2x+1) + C_2e^{2x}$.
 14.24. $y = C_1x + C_2e^{2x}$.
 14.25. $y = C_1x + C_2e^{2x}$.
 14.26. $y = C_1x + C_2e^{2x}$.
 14.27. $y = C_1x + C_2e^{2x}$.
 14.28. $y = C_1x + C_2e^{2x}$.
 14.29. $y = C_1x + C_2e^{2x}$.
 14.30. $y = C_1x + C_2e^{2x}$.
 14.31. $y = C_1x + C_2e^{2x}$.
 14.32. $y = C_1x + C_2e^{2x}$.
 14.33. $y = C_1x + C_2e^{2x}$.
 14.34. $y = C_1x + C_2e^{2x}$.
 14.35. $y = C_1x + C_2e^{2x}$.
 14.36. $y = C_1x + C_2e^{2x}$.
 14.37. $y = C_1x + C_2e^{2x}$.
 14.38. $y = C_1x + C_2e^{2x}$.
 14.39. $y = C_1x + C_2e^{2x}$.
 14.40. $y = C_1x + C_2e^{2x}$.
 14.41. $y = C_1x + C_2e^{2x}$.
 14.42. $y = C_1x + C_2e^{2x}$.
 14.43. $y = C_1x + C_2e^{2x}$.
 14.44. $y = C_1x + C_2e^{2x}$.
 14.45. $y = C_1x + C_2e^{2x}$.

Integreerida järgmised lineaarsed mittehomogeensed võrrandid (leida üldlahend).

148. $y'' - 7y' + 12y = x$. Vast. $y = C_1e^{2x} + C_2e^{-2x} + \frac{12x+7}{14}$.
 149. $y'' - a^2y = l + 1$. Vast. $y = C_1e^{ax} + C_2e^{-ax} - \frac{l+1}{a^2}$.
 150. $y'' + y' - 2y = 8 \sin 2x$. Vast. $y = C_1e^x + C_2e^{-2x} - \frac{1}{5}(6 \sin 2x + 2 \cos 2x)$.

$$\begin{aligned}
& + \frac{C}{1+C^2}; \text{ singulaarne lahend } x = -\frac{p^2-1}{(p^2+1)^2}, y = -\frac{p^3}{(p^2+1)^2}. \quad 1231. y = 3x^2. \\
1232. x + y^2 + Cy = 0. \quad 1233. x = Cy \pm \frac{a^2}{y}. \quad 1234. y = Cx + \frac{a^2}{2x}. \quad 1235. y = \\
& = Cxe^{-x}. \quad 1236. y^2 = \ln Cx^{2h}, \text{ kus } k \text{ on võrdetegur.} \quad 1237. \ln|Cx| + 2 \int \frac{y}{x} = 0. \\
1238. x^2 = C^2 + 2Cy. \quad 1239. y = \frac{x}{k - Cx}, \text{ kus } k \text{ on võrdetegur.} \quad 1240. y = \\
& = -x \ln|x| + Cx. \quad 1241. y = \frac{x^2}{2} \ln x + \frac{x^4}{12} - \frac{3x^2}{4} + C_1x + C_2. \quad 1242. y = x \ln x + \\
& + \frac{1}{6}x^3 + C_1x + C_2. \quad 1243. y = \frac{\arctan x}{2} (x^2 - 1) - \frac{x}{2} \ln(1+x^2) + \frac{x^3}{6} + C_1x + C_2. \\
1244. y = \frac{x^3}{6} - \sin x + C_1x + C_2. \quad 1245. y = \frac{x^2}{2} \left(\ln x - \frac{3}{2} \right) + C_1x + C_2. \\
1246. y = C_1x - C_1^2 \ln|x| + C_1 + C_2. \quad 1247. y = C_1 \ln|1+x| + C_2. \quad 1248. y = x^2 + \\
& + C_1 \ln|x| + C_2. \quad 1249. y = \frac{1}{2} (\ln x)^2 + C_1 \ln x + C_2. \quad 1250. y = (1 + C_1^2) \ln(C_1 + \\
& + x) - C_1x + C_2. \quad 1251. y = \frac{C_1 C_2 e^{C_1 x}}{1 - C_2 e^{C_1 x}}. \quad 1252. \cot y = C_2 - C_1x. \quad 1253. x = \\
& = C_1 \ln(y - C_1) + y + C_2. \quad 1254. y = \frac{C_1}{2} \left(e^{\frac{x-C_2}{C_1}} - \frac{x-C_2}{C_1} \right). \quad 1255. y = 1 - \\
& - \frac{1}{C_1x + C_2}. \quad 1256. y = C_1 e^{3x} + C_2 e^{4x}. \quad 1257. y = C_1 e^{\frac{x}{2}} + C_2 e^{-2x}. \quad 1258. y = C_1 + C_2 e^{7x}. \\
1259. y = C_1 + C_2 e^{\frac{4x}{3}}. \quad 1260. y = e^{2x} \left(C_1 e^{\frac{x}{3}} + C_2 e^{-\frac{x}{3}} \right). \quad 1261. y = (C_1 + C_2x) e^{-\frac{x}{4}}. \\
1262. y = (C_1 + C_2x) e^{\frac{x}{3}}. \quad 1263. y = (C_1 + C_2x) e^{\frac{x}{6}}. \quad 1264. y = (C_1 + C_2x) e^{3x}. \\
1265. y = (C_1 + C_2x) e^{-\frac{x}{2}}. \quad 1266. y = C_1 \cos 3x + C_2 \sin 3x. \quad 1267. y = \\
& = e^{-\frac{7}{2}x} \left(C_1 \cos \frac{\sqrt{19}}{2} x + C_2 \sin \frac{\sqrt{19}}{2} x \right). \quad 1268. y = C_1 \cos \sqrt{\frac{5}{2}} x + C_2 \sin \sqrt{\frac{5}{2}} x. \\
1269. y = e^{-x} \left(C_1 \cos \frac{\sqrt{6}}{2} x + C_2 \sin \frac{\sqrt{6}}{2} x \right). \quad 1270. y = e^{4x} (C_1 \cos 3x + C_2 \sin 3x). \\
1271. y = e^{\frac{5}{3}x} + 1. \quad 1272. y = e^{\frac{\pi}{3}-1}. \quad 1273. y = (x-1)e^{3x}. \quad 1274. y = \\
& = e^{3x} (\cos x + \sin x). \quad 1275. y = \frac{1}{6} [e^{x+1} - e^{-5(x+1)}]. \quad 1276. y = C_1 e^{3x} + C_2 e^{4x} + \\
& + \frac{1}{144} (12x+7). \quad 1277. y = 2x^4 - 5x^2 + 10x + C_1 + C_2 e^{-x}. \quad 1278. y = C_1 + C_2 e^{3x} + \\
& + x^3 + 2x^2 - 3x. \quad 1279. y = C_1 e^{5x} + C_2 e^{-x} - \frac{x^3}{5} + \frac{12x^2}{25} - \frac{126x}{125} + \frac{499}{625}. \\
1280. y = C_1 \cos 2x + C_2 \sin 2x + \frac{1}{4} (2x+3). \quad 1281. y = C_1 e^{-x} + e^{2x} \left(C_2 + \frac{4}{3} x \right).
\end{aligned}$$

$$\begin{aligned}
1282. y = e^{-x} \left(C_1 + C_2x + \frac{3}{2}x^2 \right). \quad 1283. y = C_1 e^{3x} + C_2 e^{-x} - \frac{x}{4} e^{-x}. \\
1284. y = e^{3x} (C_1 \cos 2x + C_2 \sin 2x) + \frac{1}{29} e^{-2x}. \quad 1285. y = C_1 e^{-x} + C_2 e^{-2x} + \frac{1}{2} e^{-5x}. \\
1286. y = e^{-\frac{3}{7}x} \left(C_1 \cos \frac{\sqrt{26}}{7} x + C_2 \sin \frac{\sqrt{26}}{7} x \right) + \left(\frac{19}{100} - \frac{3}{20} x \right) \cos x + \\
& + \left(\frac{33}{100} - \frac{1}{20} x \right) \sin x. \quad 1287. y = C_1 e^x + C_2 e^{6x} + \frac{5 \sin x + 7 \cos x}{74}. \quad 1288. y = \\
& = C_1 e^{\frac{(-2+\sqrt{5})x}{5}} + C_2 e^{\frac{(-2-\sqrt{5})x}{5}} - \frac{1}{10} \sin x - \frac{1}{5} \cos x. \quad 1289. y = e^{-x} (C_1 \cos 2x + \\
& + C_2 \sin 2x) + \left(\frac{2}{17} x - \frac{1220}{17^2} \right) \sin 2x - \left(\frac{8}{17} x + \frac{152}{17^2} \right) \cos 2x. \quad 1290. y = \\
& = C_1 \sin 3x + \left(C_2 - \frac{x}{6} \right) \cos 3x. \quad 1291. y = C_1 \cos x + \left(C_2 + \frac{x}{2} \right) \sin x + 2x^3 - \\
& - 13x + 2. \quad 1292. y = x + 3 + x^2 e^x \left(\frac{x^2}{2} - 2 \right) + e^x (C_1 + C_2x). \quad 1293. y = C_1 e^{-x} + \\
& + C_2 e^{-3x} + \frac{1}{15} e^{2x} + \frac{1}{3} x - \frac{4}{9}. \quad 1294. y = C_1 \cos \sqrt{3}x + C_2 \sin \sqrt{3}x + \frac{1}{2} \sin x - \\
& - \frac{1}{18} \sin 3x. \quad 1295. y = C_1 e^x + C_2 e^{-2x} + \frac{1}{18} e^{4x} \left(x^2 - x + \frac{7}{18} \right) + \frac{2}{3} x e^x. \\
1296. y = e^{-2x} \left(C_1 + C_2x + \frac{1}{2x} \right). \quad 1297. y = C_1 \cos x + C_2 \sin x + \cos x \ln |\cos x| + \\
& + x \sin x. \quad 1298. y = \ln |e^x - 3| + C_1 + \frac{e^x}{3} (x - \ln |3 - e^x| + C_2). \quad 1299. y = \\
& = C_1 \cos x + C_2 \sin x - \cos \ln \sqrt{\frac{1 + \sin x}{1 - \sin x}}. \quad 1300. y = e^x (x \arctan x - \\
& - \ln \sqrt{x^2 + 1} + C_1x + C_2). \quad 1301. y = C_1 + C_2 e^x + C_3 e^{6x} + \frac{7}{74} \sin x - \frac{5}{74} \cos x. \\
1302. y = C_1 e^{-x} + C_2 e^{-2x} + C_3 e^{-3x} + x^3 - \frac{31}{6} x^2 + \frac{233}{18} x - \frac{1537}{108}. \quad 1303. y = \\
& = C_1 + C_2x + C_3 e^x - \frac{1}{6} x^3 - x^2. \quad 1304. y = C_1 e^{\sqrt{2}x} + C_2 e^{-\sqrt{2}x} + C_3 \cos \sqrt{2}x + \\
& + C_4 \sin \sqrt{2}x - \frac{e^x}{3}. \quad 1305. y = C_1 + C_2x + C_3 e^{-x} + \frac{1}{12} x^4 - \frac{1}{3} x^3 + x^2. \quad 1306. x = \\
& = e^t (C_1 + C_2t), y = \frac{1}{2} e^t (2C_1 + C_2 + 2C_2t). \quad 1307. x = C_1 e^t - C_2 e^{-t} - \\
& - \frac{1}{2} (e^t + e^{-t}) + \frac{t}{2} (e^t - e^{-t}), y = C_1 e^t + C_2 e^{-t} + \frac{t}{2} (e^t + e^{-t}). \quad 1308. x = C_1 + \\
& + C_2 e^{-2t} + e^t, y = C_1 - C_2 e^{-2t} - e^t. \quad 1309. x = C_1 e^{\sqrt{2}t} + C_2 e^{-\sqrt{2}t}, y = \\
& = C_1 (1 + \sqrt{2}) e^{\frac{\sqrt{2}t}{2}} + C_2 (1 - \sqrt{2}) e^{-\frac{\sqrt{2}t}{2}}. \quad 1310. x = C_1 C_2 e^{C_1 t}, y = C_2 e^{C_1 t}. \quad 1311. x = \\
& = -C_1 e^t + C_2 e^{-t} - 2C_3 e^{2t}, y = -C_1 e^t + 3C_2 e^{-t} - 3C_3 e^{2t}, z = C_1 e^t - C_2 e^{-t} + \\
& + 5C_3 e^{2t}. \quad 1312. x = C_1 e^t + C_2 e^{-t} + C_3 e^{2t}, y = -2C_1 e^t + C_3 e^{2t}, z = -\frac{7}{2} C_1 e^t -
\end{aligned}$$