③ $y' = \underbrace{\sqrt[3]{y-1}\,(\sqrt[3]{y}-2)}_{g(y)}$

Pak $g(y) = 0 \iff y = 1$ nebo $y = 8$ +0.5

$g > 0$ na $(-\infty, 1)$, $(8, \infty)$, $g < 0$ na $(1, \infty)$ +0.5

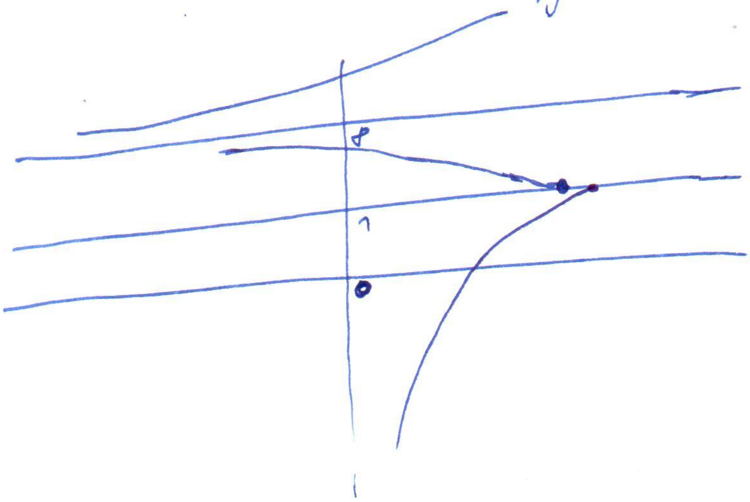
konvergence $\int \frac{1}{g}$ v krajních bodech:

$-\infty$: srovnáme s $\frac{1}{\sqrt[3]{y^2}}$, což diverguje +2

1: srovnáme s $\frac{1}{\sqrt[3]{y-1}}$, což konverguje +2

8: srovnáme s $\frac{1}{\sqrt[3]{y}-2} = \frac{(\sqrt[3]{y})^2 + 2\sqrt[3]{y} + 2^2}{y-8}$, což diverguje +2

∞: srovnáme s $\frac{1}{\sqrt[3]{y^2}}$, což diverguje +2



+1

5. $y'' - 7y' + 12y = \cos x$

$\lambda^2 - 7\lambda + 12 = (\lambda-3)(\lambda-4) \Rightarrow F.S. = \{e^{3x}, e^{4x}\}$ +3

$y_p(x) = a\cos x + b\sin x$

$y'' - 7y' + 12y = \cos x\,(-a - 7b + 12a) + \sin x\,(-b + 7a + 12b)$ +3

$y_p' = -a\sin x + b\cos x$

$y_p'' = -a\cos x - b\sin x$

$\Rightarrow \begin{aligned} 11a - 7b &= 1 \\ 7a + 11b &= 0 \end{aligned} \Rightarrow a = \frac{11}{170},\ b = \frac{-7}{170}$ +2

$\Rightarrow y = ae^{3x} + be^{4x} + \left(\frac{11}{170}\cos x - \frac{7}{170}\sin x\right)$, $a, b \in \mathbb{R}$, $x \in \mathbb{R}$ +2