$y' = 3x^2y^2 \qquad y(0) = \cancel{1}\ -\frac{1}{2}$

- $x \in \mathbb{R} = I \qquad g(y) = 3y^2 \quad h(x) = x^2$

  $y \equiv 0 \quad x \in \mathbb{R}$

  $J_1 = (-\infty, 0), \qquad J_2 = (0, \infty)$

- $\frac{y'}{y^2} = 3x^2$

  $\int \frac{1}{y^2}\,dy = \int 3x^2\,dx$

  $G(y) \rightarrow \boxed{-\frac{1}{y} = x^3 + c} \leftarrow H(x) + c$

- (a) $x \in \mathbb{R}, \quad y \in J_1 = (-\infty, 0)$

  $G(J_1) = (0, \infty) \qquad$ fix c

  $x^3 + c > 0 \qquad x^3 > -c \qquad \boxed{x^{\cancel{3}} > \sqrt[3]{-c}}$

  $\boxed{\frac{-1}{x^3+c} = y}$

- (b) $x \in \mathbb{R} \qquad y \in J_2 = (0, \infty)$

  $G(J_2) = (-\infty, 0) \qquad$ fix $c \qquad x^3 + c < 0 \qquad x < \sqrt[3]{-c}$

  $y = \frac{-1}{x^3+c}$

  Poč. podm. $\quad y \equiv 0$ nelze

  $y(0) = -\frac{1}{2} = \frac{-1}{0^3+c} \quad \rightarrow \quad c = 2$

  $y = \frac{-1}{x^3+2} \qquad x \in (-\sqrt[3]{2}, \infty)$

- Závěr: $\quad y_1 \equiv 0 \qquad x \in \mathbb{R}$

  $y_2 = \frac{-1}{x^3+c} \qquad x \in (-\infty, -\sqrt[3]{c})$

  $-\|- \qquad x \in (-\sqrt[3]{c}, \infty)$