\[ y_0 = \frac{-c x^2}{c x - 1}; \]
\[ D[y_0, x] = \frac{y_0^2 + 2 x y_0}{x^2} \]
\[
\frac{c^2 x^2}{(-1 + c x)^2} - \frac{2 c x}{-1 + c x} = \frac{c^4 x^4}{(-1 + c x)^2} - \frac{2 c x^3}{-1 + c x} \]
\[ D[y_0, x] = \frac{y_0^2 + 2 x y_0}{x^2} \quad \text{// Simplify} \]
True
\[ D[y_0, x] = \frac{y_0^2 + 2 x y_0}{x^2} \]
\[
\frac{c^2 x^2}{(-1 + c x)^2} - \frac{2 c x}{-1 + c x} = \frac{c^4 x^4}{(-1 + c x)^2} - \frac{2 c x^3}{-1 + c x} \]
\[ \text{DSolve}[D[y[x], x] = \frac{y[x]^2 + 2 x y[x]}{x^2}, y[x], x] \]
\[ \{ \{ y[x] \to -\frac{x^2}{x - C[1]} \} \} \]
\[ \text{Integrate}\left[\frac{1}{v (v + 1)}, v\right] \]
\[ \text{Log}[v] - \text{Log}[1 + v] \]