$$x\,dy - y\,dx = (xy)^{\frac{1}{2}}\,dx$$ (1

$$x\frac{dy}{dx} - y = x^{\frac{1}{2}}y^{\frac{1}{2}}$$

$$y' - \frac{1}{x}y = x^{-\frac{1}{2}}y^{\frac{1}{2}}$$

<u>משוואת ברנולי:</u> (אם $n=0$ או $n=1$ אז זו משוואה לינארית)
(נקרא ברנולי)

$$y' + P(x)\,y = y^n Q(x)$$

הפתרון: $$y^{1-n} = \left[C + (1-n)\int Q(x)\,e^{\int (1-n)P(x)\,dx}\,dx\right]e^{-\int (1-n)P(x)\,dx}$$

$$n = \frac{1}{2} \quad => \quad 1-n = \frac{1}{2} \quad , \quad P_{(x)} = -\frac{1}{x} \quad , \quad Q_{(x)} = x^{-\frac{1}{2}}$$

$$y^{1/2} = \left[C + \frac{1}{2}\int x^{-\frac{1}{2}}e^{\int -\frac{1}{2}\cdot\frac{1}{x}dx}\,dx\right]e^{\int \frac{1}{2}\cdot\frac{1}{x}dx}$$

$$y^{1/2} = \left[C + \frac{1}{2}\int x^{-\frac{1}{2}}e^{-\frac{1}{2}\ln} \quad dx\right]e^{\frac{1}{2}\ln}$$

$$y^{1/2} = \left[C + \frac{1}{2}\int x^{-\frac{1}{2}}e^{\ln \quad -1/2}\,dx\right]e^{\ln \quad 1/2}$$

$$y^{1/2} = \left[C + \frac{1}{2}\int x^{-\frac{1}{2}}x^{-\frac{1}{2}}\,dx\right]x^{\frac{1}{2}}$$

$$y^{1/2} = \left[C + \frac{1}{2}\int \frac{1}{x}\,dx\right]\sqrt{x}$$

$$y^{1/2} = \left[C + \frac{1}{2}\ln x\right]\sqrt{x}$$

$$y^{1/2} = \left[C + \ln\sqrt{x}\right]\sqrt{x}$$

$$y = x\left(C + \ln\sqrt{x}\right)^2$$