Sección 1,4

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

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

$$\operatorname{sen}^{-1}(y) + c = \sqrt{x} + c$$

$$y = \operatorname{sen}\sqrt{x} + c.$$

12.

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

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

$$*\cancel{2}\left(\frac{1}{\cancel{2}}\ln y^2+1\right) = \left(\frac{x^2}{2} + c\right) * \cancel{2}$$

$$\ln y^2 + 1 = x^2 + c$$

$$e^{\ln y^2+1} = e^{x^2+c}$$

$$y^2 + 1 = e^{x^2} \cdot e^c$$

$$y^2 = e^{x^2} \cdot e^c - 1$$

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$$y' = 1 + x + y + xy$$

$$\frac{dy}{dx} = 1 + x + y\,(1+x)$$

$$\frac{dy}{dx} = (1+x)(1+y)$$

$$\int \frac{dy}{1+y} = \int 1 + x \, dx$$

$$\ln(1+y) = x + \frac{x^2}{2} + c$$

$$1 + y = e^{x} + \frac{x^2}{2} + C$$

$$y = e^{x + \frac{x^2}{2} + c} - 1$$

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

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

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

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

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

$$\tan^{-1} y = -\frac{1}{x} - x + C$$

$$y = \tan\left(-\frac{1}{x} - x + c\right)$$

25.

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

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

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

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

$$\ln(y) = x^2 + \ln(x) + C$$

$$y = e^{x^2} \cdot x \cdot e^{c}$$

$$1 = e \cdot c$$

$$c = \frac{1}{e}$$

$$y = e^{x^2} \cdot x \cdot e^{\frac{1}{e}}$$

Solución Particular

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$y(0) = 0$

$$\frac{dy}{dx} = 6e^{2x-y}$$

$$\frac{dy}{dx} = 6 \cdot \frac{e^{2x}}{e^{y}}$$

$$\int e^{y}\,dy = 6\int e^{2x}\,dx$$

$$e^{y} = 6\,\frac{e^{2x}}{2} + c$$

$$\ln e^{y} = \ln\left(6\,\frac{e^{2x}}{2} + c\right)$$

$$y = \ln(3e^{2x} + c)$$

$$0 = \ln(3 + c)$$

$$1 = 3 + C$$

$$C = -2$$

$$\boxed{y = \ln 3e^{2x} - 2}$$