Find the general solution to the differential equations

1 $\frac{dy}{dx} = \frac{x}{y^2}$ Get to $y^3 =$	2 $\frac{dy}{dx} = 2xy^2$ Get to $y =$	3 $x\frac{dy}{dx} = y$ Get to $y =$	4 $x\frac{dy}{dx} = -2y$ Get to $y =$
5 $\frac{1}{\sin x}\frac{dy}{dx} = y^2$ Get to $y =$	6 $\frac{dy}{dx} = 3e^y \sin x$ Get to $y =$	7 $\frac{dx}{dt} = 1 - 2x$ Get to $x =$	8 $2x + \frac{dx}{dt} = x\sqrt{t}$ Get to $x =$
9 $\frac{dx}{dt} = \frac{t\sqrt{t^2+3}}{e^{2x}}$ Get to $x =$	10 $\frac{dx}{dt} = \frac{\sqrt{2x+1}}{x}\cos^2 t$ Get to $f(x) = g(t)$	11 $\frac{\sec^2 x}{\cos^2 2t}\frac{dx}{dt} = 2$ Get to $\tan x =$	12 $t(t-1)\frac{dx}{dt} = x$ Get to $x =$

Find the general solution to the differential equations - answers

1 $y^3 = \frac{3x^2}{2} + c$	2 $y = \frac{1}{-x^2 - c}$ $= -\frac{1}{x^2} + c$	3 $y = xe^c = Ax$	4 $y = Ae^{-2\ln x}$
5 $y = \frac{1}{\cos x - c}$	6 $y = \ln\frac{1}{3\cos x + c}$	7 $x = \frac{1 - e^{-2(t+c)}}{2}$ $= \frac{1 - Ae^{-2t}}{2}$	8 $\ln\lvert x\rvert = \frac{2t^{\frac{3}{2}}}{3} - 2t + c$ or $x = Ae^{\left(\frac{2t^{\frac{3}{2}}}{3} - 2t\right)}$
9 $x = \frac{1}{2}\ln\frac{2}{3}(t^2+3)^{3/2} + c$	10 $4(2x+1)^{3/2} - 12\sqrt{2x+1}$ $= 12t + 3\sin 2t + c$	11 $\tan x = t + \frac{\sin 4t}{4} + c$	12 $x = \frac{A(t-1)}{t}$

Find the particular solution to the differential equations

1 $$\frac{1}{x}\frac{dy}{dx} = y^3$$ $(1,1)$ Get to $y^2 =$	2 $$\frac{dy}{dx} = \frac{e^{2x}}{y}$$ $(0,4)$ Get to $y^2 =$	3 $$\frac{dy}{dx} = \frac{2y}{(x^2-1)}$$ $(2,1)$ Get to $y =$	4 $$\frac{dy}{dx} = 6 + 2y$$ $(0,4)$ Get to $y =$
5 $$\frac{dy}{dx} = \frac{(y^3+1)\cos x}{y^2}$$ $\left(\frac{\pi}{2}, 5\right)$ Get to $f(y) = g(x)$	6 $$\frac{dy}{dx} = \frac{2xe^x}{y^3}$$ $(0,4)$ Get to $y^4 =$	7 $$\frac{dx}{dt} = \frac{6te^{t^2}}{x+2}$$ $(1,2)$ Get to $f(x) = g(t)$	8 $$\frac{dx}{dt} = \frac{x^2+x-2}{t}$$ $(e,5)$ Get to $f(x) = g(t)$
9	10	11	12

Find the particular solution to the differential equations - answers

1 $y^2 = \frac{1}{2 - x^2}$	2 $y^2 = e^{2x} + 15$	3 $y = \frac{3(x-1)}{x+1}$	4 $y = 7e^{2x} - 3$
5 $\ln\lvert y^3 + 1\rvert = 3\sin x + \ln 126 + 3$	6 $y^4 = 8xe^x - 8e^x + 264$	7 $y^2 + 4y = 6e^{x^2} + 12 - 6e$	8 $\ln\left\lvert\frac{y-1}{y+2}\right\rvert = 3\ln x + \ln\frac{4}{7} - 3$
9	10	11	12