SATPREP

Assignment : ***Differential Equation***

QUESTIONS:

1) $\frac{dy}{dx} = -\frac{x^2+y^2}{2xy}$	2) $\frac{dy}{dx} = \frac{xy-y^2}{x^2}$
3) $\frac{dy}{dx} = e^x - y$	4) $x\frac{dy}{dx} - 3y = x^2$
5) $2\frac{dy}{dx} - y = e^{\frac{x}{2}}$	6) $xdy + ydx = \sin x\left(dx\right)$
7) $\frac{dy}{dx} = \frac{y-x}{x+y}$	8) $\left(x\sin\frac{y}{x} - y\cos\frac{y}{x}\right)dx + x\cos\frac{y}{x}dy = 0$
9) $2\frac{dy}{dx} - y = e^{\frac{x}{2}}$	10) $\frac{dy}{dx} = \frac{y}{x+y}$
11) $x\frac{dy}{dx} = x + y$ and $\left(1, \ln 2\right)$	12) $\frac{dy}{dx} = -\frac{x}{y} - 2$

ANSWERS:

1) $x^3 + 3xy^2 = e^C$	2) $y = \frac{x}{\ln\lvert x\rvert + C}$
3) $y = \frac{1}{2}e^x + Ce^{-x}$	4) $y = -x^2 + Cx^3$
5) $y = \frac{1}{2}e^{x/2}(x + C)$	6) $y = \frac{1}{x}(C - \cos x)$
7) $\frac{1}{2}\ln(x^2 + y^2) + \tan^{-1}\left(\frac{y}{x}\right) = C$	8) $\sin\left(\frac{y}{x}\right) = \frac{C}{x}$
9) $e^{\frac{x}{2}}\left[\frac{1}{2}x + C\right]$	10) $\ln y = \frac{x}{y} - 1$
11) $y = x\left(\ln 2x\right)$	12) $-\ln\left\lvert\frac{y+x}{x}\right\rvert - \frac{x}{x+y} = \ln C\lvert x\rvert$