Math 1221: Recitation 6 (T)

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(1) Solve the following integrals.

(a) Find the particular solution to the differential equation $y'x^2 = y$, given that $y(1) = \frac{2}{e}$.

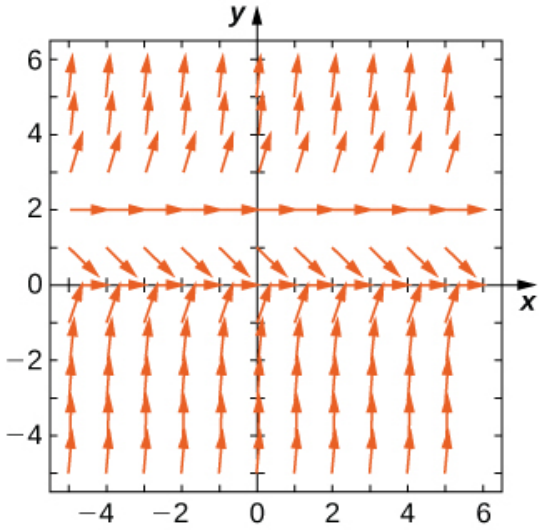
(b) Show that $y = 3 - x + x\ln x$ solves the differential equation $y' = \ln x$.

(c) Find the general solution to $y' = 2t\sqrt{t^2 + 16}$.

(d) Substitute $y = a\cos(2t) + b\sin(2t)$ into $y' + y = 4\sin(2t)$ to find a particular solution.

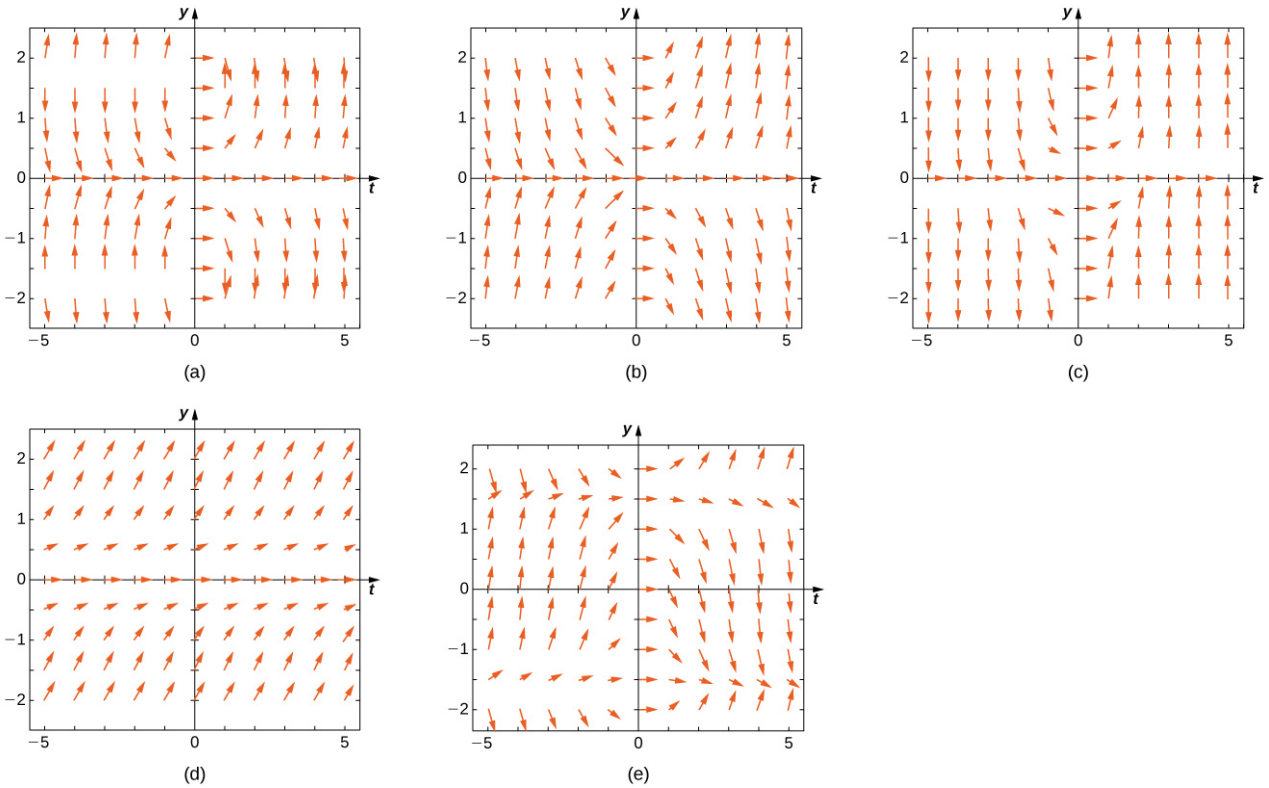
(2) Solve the following questions. **(Do any one of them)**.

(a) The direction field for the differential equation $y' = y^2 - 2y$ is given.



(i) Sketch a graph of the solution with initial value $y(0) = 3$.
(ii) Sketch a graph of the solution with initial value $y(0) = -1$.
(iii) What are the equilibrium values? What are their stabilities (stable, unstable, or semi-stable)?

(b) Match the direction fields to the corresponding differential equations.



$y' = t\sin(y)$ $\quad y' = -t\cos(y)$ $\quad y' = t\tan(y)$ $\quad y' = \sin^2(y)$ $\quad y' = y^2t^3$