Suggested problems

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1. Solve the differential equation:

$$y' = \sin(t) + \frac{5}{1+t^2}.$$

   Find the solution such that $y(0) = 1$.

2. Solve the differential equation:

$$y' = 2te^{t^2} - 7t^4.$$

3. Draw the directional field for each of the given differential equations. Based on the directional field, determine the behavior of y as $t \to \infty$.

   (a) $y' = 3 - 2y$;

   (b) $y' = y + 2$.