



CHAPTER 1

Problem 1. Solve the IVP $\frac{dx}{dt} = -x + 5$, $x(0) = x_0$.

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Problem 2. Solve the IVP $\frac{dx}{dt} = -2x + 10$, $x(0) = x_0$.

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Problem 3. Determine the values of r for which the given differential equation has solutions of the form $x = e^{rt}$. The equation is:

$$x' + 2x = 0$$

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Problem 4. Do the same question as above, except with the equation:

$$x''' - 3x'' + 2x' = 0.$$

SECTION 2.1

Problem 5. Find the general solution to $x' + 3x = t + e^{-2t}$.

SECTION 2.1

Problem 6. Find the general solution to $x' + x = te^{-t} + 1$.

SECTION 2.1

Problem 7. Solve the IVP $x' + \frac{2}{t}x = \frac{\cos t}{t^2}$, $x(\pi) = 0$, $t > 0$.

SECTION 2.1

Problem 8. Solve the IVP $tx' + (t + 1)x = t$, $x(\ln 2) = 1$, $t > 0$.

SECTION 2.1

Problem 9. Describe the behavior of the solution corresponding to the initial value a_0 for the IVP $x' - \frac{1}{2}x = 2 \cos t$, $x(0) = a_0$.