Worksheet 21

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Solve the differential equation

1. $y'' - 4y' + y = 0$.

2. $y'' + 3y' = 0$.

Solve the initial-value problem

3. $2y'' + 5y' - 3y = 0$, $y(0) = 1$, $y'(0) = 4$.

4. $y'' - 2y' + 5y = 0$, $y(\pi) = 0$, $y'(\pi) = 2$.

Solve the boundary-value problem, if possible.

5. $y'' + 4y' + 13y = 0$, $y(0) = 2$, $y(\pi/2) = 1$.

6. $y'' - 6y' + 9y = 0$, $y(0) = 1$, $y(1) = 0$.

7. If a, b, c are all positive constants and $y(x)$ is a solution of the differential equation $ay'' + by' + cy = 0$, show that $\lim_{x \to \infty} y(x) = 0$.