1. Find the solution to the given initial value problem.

(a)
$$y'' + 10y' + 25y = 0$$
,

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, $y(0) = 2$, $y'(0) = -1$.

(b)
$$y'' + 9y = 0$$
, $y(0) = -2$, $y'(0) = 3$.

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

2. Use the method of reduction of order to find a fundamental set of solutions.

(a)
$$t^2y'' + 2ty' - 2y = 0$$
, $t > 0$, $y_1(t) = t$.

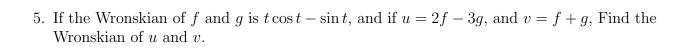
(b)
$$(t-1)y'' - ty' + y = 0$$
, $t > 0$, $y_1(t) = e^t$.

3. Verify that the functions y_1 and y_2 are solutions of the given differential equation. Do they constitute a fundamental set of solution

(a)
$$x^2y'' - x(x+2)y' + (x+2)y = 0$$
, $x > 0$ $y_1(x) = x$, $y_2(x) = xe^x$.

(b)
$$y'' + 4y = 0$$
, $y_1 = 2\sin x^2 - 1$, $y_2 = 3\sin^2 x - \cos^2 x - 1$.

4. If the Wronskian of f and g is $3e^{4t}$ and $f(t)=e^{2t}$, find g(t).



 $6.\ \,$ Find the general solution to the following equations

(a)
$$y'' - y' = t$$

(b)
$$y'' - 2y' - 3y = 3te^{2t}$$
.

(c)
$$y'' - 2y' - 3y = -3e^{-t}$$
.