

Answer Key for Sample Exam 2

October 19, 2009

1. F
2. F
3. E
4. E
5. None of the choices work. The solution is $c_1 + c_2e^{-2x} + q(x)$. The better way to think of this problem is as $y'' + 2y' = f(x) - 1$. First find the homogeneous solution and then find the particular solution to $f(x) - 1$. The problem tells us that $q(x)$ is the particular solution to $y'' + 2y' + 1 = f(x)$, so we are done. On the other hand if the problem was written as $y'' + 2y' + y = f(x)$, then C would be the correct answer.
6. F
7. C
8. C
9. D
10. B
11. None of the choices work. The solution is $\frac{1}{2}xe^x - \frac{1}{2}e^x$
12. D
13. (a) $W = e^{-4t}$
(b) underdamped
(c) $y = e^{-2t}(C_1\cos(t) + C_2\sin(t)) + \frac{1}{13}\cos(2t) + \frac{8}{13}\sin(2t)$