Quiz 2 Calc 2 4/2/2003

Each problem is worth 5 points. For full credit provide complete justification for your answers.

1. Determine whether $y = e^{3x}$ is a solution to the differential equation $y'' - 4y' + 3y = 0$.

$y = e^{3x}$

$y' = 3e^{3x}$

$y'' = 9e^{3x}$

$9e^{3x} - 4(3e^{3x}) + 3(e^{3x}) = 0$

$9e^{3x} - 12e^{3x} + 3e^{3x} = 0$

$12e^{3x} - 12e^{3x} = 0$

$0 = 0$

Yes, the solution works!! ☺

2. Determine whether $y = x \sin x$ is a solution to the differential equation $y'' + y = 2 \cos x$.

$y = x \sin x$

$y' = \sin x + x \cos x$

$y'' = \cos x + \cos x - x \sin x$

$y'' = 2\cos x - x \sin x$

$2\cos x - x\sin x + x\sin x = 2\cos x$

$2\cos x = 2\cos x$

☺

Yes, solution works