Math 1B Quiz 6

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Name: _____ Score: _____ /10

You have twenty minutes (plus the break) to complete the following closed-note open-chalkboard quiz. Partial credit will be awarded for correct work, and no points will be given for simply writing down the correct answer. Please box your final answers.

1. (5 pts) Find the general solution to the differential equation:

$$y'' - 4y' + 13y = 0$$

$$
\begin{aligned}
0 &= r^2 - 4r + 13 \\
r &= \frac{4 \pm \sqrt{4^2 - 4 \cdot 13}}{2} \\
&= 2 \pm 3i \\
y(t) &= e^{2t}\left(c_1 \cos 3t + c_2 \sin 3t\right)
\end{aligned}
$$

2. (0 pts) Where have you never traveled but really want to?

   Afghanistan.

3. (5 pts) Solve the initial value problem:

$$y'' + y' - 42y = 0, \quad y(0) = -1, \quad y'(0) = 20$$

$$
\begin{aligned}
0 &= r^2 + r - 42 \\
r &= \frac{-1 \pm \sqrt{1 + 4 \cdot 42}}{2} \\
&= -7 \text{ or } 6 \\
y(t) &= c_1 e^{-7t} + c_2 e^{6t} \\
-1 &= c_1 + c_2 \\
20 &= -7c_1 + 6c_2 \\
c_2 &= 1 \\
c_1 &= -2 \\
y(t) &= -2e^{-7t} + e^{6t}
\end{aligned}
$$