Name: ID #: Section #:

Q1) [**3.5pts**] Solve the initial value problem

$$\frac{d^2y}{d\theta^2} + y = 0,\ y(\pi/3) = 0,\ y'(\pi/3) = 2$$

Q2) [**3.5pts**] The function $y_1 = e^{x/3}$ is a solution of $6y'' + y' - y = 0$. Use reduction of order to find a second solution $y_2(x)$ of the given equation.

Q3) [**3pts**] Find a linear differential operator that annihilates the given function.

(a) x^2e^{-x} (b) $8x - \sin x + 10\cos 5x$

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Q1) [**3.5pts**] The function $y_1 = e^{x/3}$ is a solution of $6y'' + y' - y = 0$. Use reduction of order to find a second solution $y_2(x)$ of the given equation.

Q2) [**3.5pts**] Solve the boundary value problem

$$y'' - 2y' + 2y = 0,\ y(0) = 1,\ y(\pi/2) = 1$$

Q3) [**3pts**] Find a linear differential operator that annihilates the given function.

(a) $(2 - e^x)^2$ (b) $4\cos x + 3\sin x - 8$