Name: ID #: Section #:

(Q1) Verify that the functions $e^{x/2}$, $xe^{x/2}$ form a fundamental set of solutions of the DE
$$4y'' - 4y' + y = 0.$$

___Solution:___

(Q2) The function $y_1(x) = x^4$ is a solution of $x^2y'' - 7xy' + 16y = 0$. Use reduction of order to find a second solution $y_2(x)$ of the given equation. Write the general solution of the equation.

___Solution:___

(Q3) Verify that the two-parameter family $y = c_1 x^{-1/2} + c_2 x^{-1} + \dfrac{1}{15}x^2 - \dfrac{1}{6}x$ is the general solution of the nonhomogeneous linear equation $2x^2 y'' + 5xy' + y = x^2 - x$ on the interval $(0, \infty)$.

Solution:

Name: ID #:   Section #:

(Q1) Verify that the functions $x, x^{-2}, x^{-2}\ln x$ form a fundamental set of solutions
       of the DE
$$x^3 y''' + 6x^2 y'' + 4xy' - 4y = 0.$$

Solution:

(Q2) The function $y_1(x) = x^2$ is a solution of $x^2 y'' + 2xy' - 6y = 0$. Use reduction of
       order to find a second solution $y_2(x)$ of the given equation. Write the general
       solution of the equation.

Solution:

(Q3) Verify that the two-parameter family $y = c_1 e^{2x} + c_2 e^{5x} + 6e^x$ is the general solution of the nonhomogeneous linear equation $y'' - 7y' + 10y = 24e^x$ on the interval $(-\infty, \infty)$.

Solution: