KING FAHD UNIVERSITY OF PETROLEUM & MINERALS

DEPARTMENT OF MATHEMATICS & STATISTICS

MATH131 – Section 02 (Term 142)

Date: March 3, 2015 **Quiz 2** Duration: 20 minutes

Family Name: _____ **ID #:** __ __ __ __ __ __ __ __ __ **Serial #:** __ __

1. Two lines, L_1 and L_2, are passing through the point $(5, -4)$. L_1 is parallel to the line $y = -4x + 3$, and L_2 is perpendicular to it. Find the equations of these two lines. (**5 points**)

2. Solve the following nonlinear system algebraically:

$$\begin{cases} y = \dfrac{4}{x} \\ 3y = 2x + 2 \end{cases}$$

(**6 points**)

3. A business problem has been modelled by the following system of equations:

$$\begin{cases} 2q_1 + 3q_2 = -1 \\ 2q_1 + q_2 = 5 \\ q_1 + q_2 = 1 \end{cases}$$

(**2 + 5 + 2 = 9 points**)

a) Write the augmented coefficient matrix.

b) Reduce the matrix you obtained in (a) above.

c) What is the solution for the system?

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DEPARTMENT OF MATHEMATICS & STATISTICS

MATH131 – Section 03 (Term 142)

Date: March 3, 2015 **Quiz 2** Duration: 20 minutes

Family Name: _____ **ID #:** _ _ _ _ _ _ _ _ _ _ **Serial #:** _ _

1. For which values of $\boldsymbol{a}$ and $\boldsymbol{b}$ does the parabola $y = ax^2 + bx + 3$ have a vertex at $(2, -1)$. (**5 points**)

2. Solve the following nonlinear system algebraically:

$$\begin{cases} x^2 = y^2 + 13 \\ y = x^2 - 15 \end{cases}$$

(**6 points**)

3. Consider the following system of equations:

$$\begin{cases} 2x_1 + 3x_2 + 2x_3 + 6x_4 = 10 \\ \quad\quad x_2 + 2x_3 + \quad x_4 = 2 \\ 3x_1 \quad\quad - 3x_3 + 6x_4 = 9 \end{cases}$$

(2 + 5 + 2 = 9 points)

a) Write the augmented coefficient matrix.

b) Reduce the matrix you obtained in (a) above.

c) What is the solution for the system?