Student ID: ____________

Quiz 1

This quiz is graded out of 10 marks. No books, calculators, notes or cell phones are allowed. You must show all your work, the correct answer is worth 1 mark the remaining marks are given for the work. If you need more space for your answer use the back of the page.

Question 1. §1.1 #TF *(3 marks)* Determine whether the statement is true or false, and justify your answer.
If each equation in a consistent linear system is multiplied through by a constant c, then all solutions to the new system can be obtained by multiplying solutions from the original system by c.

False, a counterexample to the statement is

$$x+y=2$$
$$2x+3y=5$$

has a unique solution of $x=1$ $y=1$

Let $c=2$

then

$$2x+2y=4$$
$$4x+6y=10$$

does not have solution $x=2,\ y=2$

Question 2. §1.1 #11a *(1 mark)* Find a system of linear equations correcponding to the given augmented matrix.

$$\begin{bmatrix} 2 & 0 & 0 \\ 3 & -4 & 0 \\ 0 & 1 & 1 \end{bmatrix}$$

$$\begin{aligned} 2x \quad &= 0 \\ 3x - 4y &= 0 \\ y &= 1 \end{aligned}$$

Question 3. §1.1 #14b *(2 marks)* Find the augmented matrix for the given system of linear equations

$$\begin{aligned} 2x_1 \quad\quad + 2x_3 &= 1 \\ 3x_1 - x_2 + 4x_3 &= 7 \\ 6x_1 + x_2 - x_3 &= 0 \end{aligned}$$

$$\begin{bmatrix} 2 & 0 & 2 & 1 \\ 3 & -1 & 4 & 7 \\ 6 & 1 & -1 & 0 \end{bmatrix}$$

Question 4. §1.1 #8 *(2 marks)* Determine whether the given vector $(13,5,2)$ is a solution of the linear system

$$\begin{aligned} 2x_1 - 4x_2 - x_3 &= 1 \\ x_1 - 3x_2 + x_3 &= 1 \\ 3x_1 - 5x_2 - 3x_3 &= 1 \end{aligned}$$

$$2(13)-4(5)-2=4 \neq 1$$

Does not satisfy the first equation
$\therefore$ not a solution

Question 5. §1.1 #10b *(2 marks)* Find the solution set of the linear equation by using parameters as necessary

$$3v-8w+2x-y+4z=0$$

Let $w=s$
$x=t$ $\quad s,t,q,r \in \mathbb{R}$
$y=q$
$z=r$

$$3v-8s+2t-q+4r=0$$

$$v=\frac{-4r+q-2t+8s}{3}$$

$$\therefore (v,w,x,y,z)=\left(\frac{-4r+q-2t+8s}{3},\ s,\ t,\ q,\ r\right) \quad s,t,q,r \in \mathbb{R}$$