Question 1:

(a)[2 points] Determine the slope and y-intercept of the line $3x - 2y = 5$.

(b)[2 points] Determine an equation of the line through $(3, -7)$ with slope undefined.

(c)[3 points] Determine an equation of the line through the points $(7, 1)$ and $(3, -7)$.

(d)[3 points] Determine an equation of the line that is parallel to the line $x - 2y = -3$ and which passes through the point $(-3, 8)$.

Question 2:

(a)[5 points] The relationship between degrees Celsius ($^\circ C$) and degrees Fahrenheit ($^\circ F$) is linear. Find a linear relation (that is, the equation of the line) relating $^\circ C$ and $^\circ F$ if $0^\circ C$ corresponds to $32^\circ F$ and $100^\circ C$ corresponds to $212^\circ F$, and then use the relation you found to convert $68^\circ F$ to $^\circ C$.

(b)[5 points] Determine whether the following lines are parallel, coincident or intersecting:

$$\begin{aligned} L: \quad & 4x - 2y = -7 \\ M: \quad & -2x + y = -1 \end{aligned}$$

Question 3:

(a)[5 points] Determine the point of intersection of the lines

$$L: \quad 4x + 3y = 2$$
$$M: \quad 2x - y = 1$$

(b)[5 points] A person has 20 coins which total \$1.65. If the coins consist of nickels (5¢ pieces) and dimes (10¢ pieces), how many of each type of coin does the person have? Clearly define your variables and state a clear conclusion.

Question 4:

(a)[5 points] A certain product has supply equation $S = 40p + 300$ and a market price of \$30. Each \$4 increase in price reduces demand by 100 units. At what price does demand drop to 1175 units?

(b)[5 points] A ferry service has different fare options. One option is to pay a one-time fee of \$52 to join their frequent traveller club and then pay \$15 for every trip on the ferry. A second option is to simply pay a \$19 fare for each trip without joining the frequent traveller club. How many trips are required for both options to be equivalent in terms of cost?

Question 5 [10]: Solve the following system of equations **using matrix reduction** (no credit will be given for using any other method). Use proper notation to clearly state the row operations used at each step and clearly state the final solution.

$$\begin{aligned} 3x - 3y - z &= 1 \\ -x + 2y + z &= 5 \\ 3x - 4y - z &= 1 \end{aligned}$$