MA1S12 Group A2 Quiz 01 11am 25/1/18 ANSWERS

Rules and procedures.
1. You are welcome to consult notes and collaborate during tutorials. **2.** You should **attempt 3 questions**. If more are attempted, then the first three attempted will be marked. All questions will be marked out of 20, so all quizzes will contribute 60 marks. **3.** Answer sheets will be collected at the end of each tutorial. **4.** Answer sheets will not be accepted at any other time or in any other way. **5.** Answer sheets will be marked and returned the following week. **6.** Answers to each quiz will be distributed the following week. **7.** Show all your work. **8.** If a particular method is stipulated, such as Cramer's Rule, you must use it. No credit will be given for the wrong method. **9.** Course work will contribute 20% to your overall mark.

(1) (a) Give an equation for the line through (1,1) perpendicular to the direction (2,1) (Hint: $\vec{N} \cdot C\vec{X} = 0$).

(b) Give an equation for the plane through $(2, 1, 3)$ perpendicular to the direction $(2, 0, 1)$.

Answer. (a) $2x + y = 3$ (b) $2x + y + 3z = 7$.

(2) Solve by Cramer's rule **(no other method)**

$$\begin{bmatrix} 1 & -3 \\ 3 & -10 \end{bmatrix} \begin{bmatrix} x \\ y \end{bmatrix} = \begin{bmatrix} -6 \\ -21 \end{bmatrix}$$

Answer.

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x= det(R,Q)/det (P,Q) = -3.000000/-1.000000 = 3.000000
y= det(P,R)/det (P,Q) = -3.000000/-1.000000 = 3.000000
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(3) Use the adjoint matrix formula **(no other method)** to invert the following matrix

$$\begin{bmatrix} 1 & -3 \\ 3 & -10 \end{bmatrix}$$

Answer.

$$(-1) \begin{bmatrix} -10 & 3 \\ -3 & 1 \end{bmatrix}$$

(4) Calculate $\det A^{-1}$ where A is as in question (3).
Answer. Determinant is -1.

(5) Calculate the determinant of the following matrix

$$\begin{bmatrix} -1 & 2 & 3 \\ -1 & 2 & 4 \\ 3 & -7 & -12 \end{bmatrix}$$

Answer. Determinant $= (-1, 2, 3) \cdot (4, 0, 1) = -1$.