

MAU11S02 Group A1 Quiz 01 9am 29/1/20

Rules and procedures.

1. Answers must be handed up at the end of the tutorial, no other time. **2.** Attempt 3 questions. Only *your first three answers* will be marked. **3.** Each question carries 20 marks, so the maximum quiz mark is 60. **4.** Marked quizzes will be returned, and answers published, the following week. **5.** If a particular method of solution is stipulated, you get no marks if you don't use it. **6.** The (9) quizzes will contribute 20% to your overall mark. **7.** You are allowed to collaborate and compare answers during the tutorial. **8. *Show all work.*** No marks will be given for answers which do not show the calculations.

Question 1. Find the equation of the plane through $P = (1, 1, -3)$, $Q = (-1, -2, 6)$, $R = (1, 3, -8)$ (remember that $\vec{PQ} \times \vec{PR}$ is normal (perpendicular) to the plane).

Question 2. Calculate the adjoint matrix, and hence invert

$$\begin{bmatrix} 2 & -6 \\ -3 & 11 \end{bmatrix}$$

Question 3. Determine whether the four points $P = (1, 1, -3)$, $Q = (-1, -2, 6)$, $R = (1, 3, -8)$, and $S = (9, -3, 1)$ are coplanar; show all work.

Question 4. Calculate the triple product $P \cdot (Q \times R)$, where $P = (1, 1, -3)$, $Q = (-1, -2, 6)$, $R = (1, 3, -8)$

Question 5. Use Cramer's Rule to calculate *any one* of the three coordinates x, y, z of the solution to the following system of equations.

$$1x + -1y + 1z = 4$$

$$1x + -2y + 3z = 5$$

$$-3x + 6y + -8z = 6$$