

INSTRUCTIONS

Full marks will be awarded for the correct solutions to **ALL QUESTIONS**. This paper will be marked out of a TOTAL MAXIMUM MARK OF 100. Credit will be given for clearly presented solutions.

**BSc (Hons) in Computer Games Development****YEAR 1****CLASS TEST 2****1.** Let

$$A = \frac{1}{2} \begin{pmatrix} -4 & 8 & 2 \\ -3 & 5 & 3 \\ -2 & 4 & 0 \end{pmatrix} \quad B = \begin{pmatrix} 6 & -4 & -7 \\ 3 & -2 & -3 \\ 1 & 0 & -2 \end{pmatrix}$$

Determine $A.B$. What comment can you make about the matrix A ?

20 marks**2.** Let

$$A = \begin{pmatrix} -5 & 1 & 4 \\ -1 & 1 & 1 \\ -4 & 1 & 3 \end{pmatrix}$$

By a sequence of *row operations* find A^{-1} , the *inverse* of A . Use this inverse to find the solution of the following system of linear equations.

$$-5x + y + 4z = 0$$

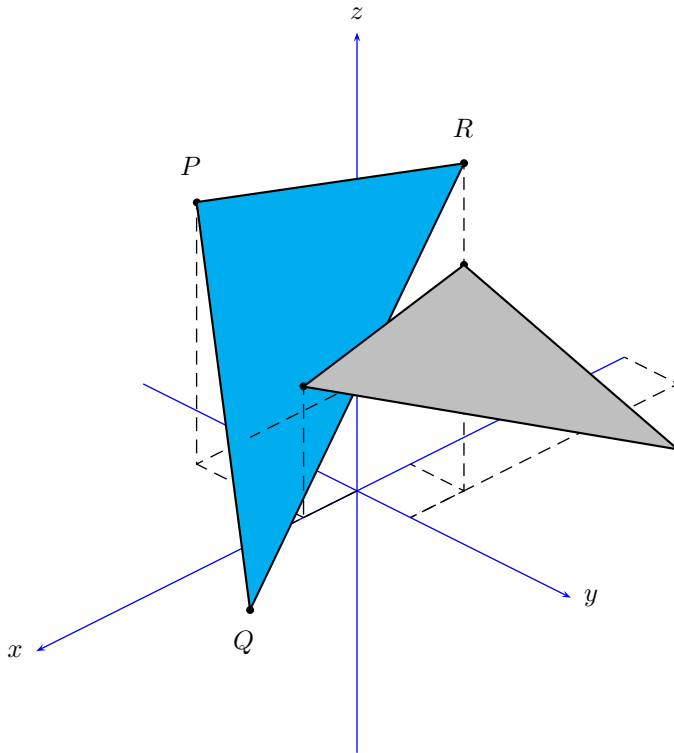
$$-x + y + z = 2$$

$$-4x + y + 3z = 1$$

50 marks

3. Consider the following points in \mathbb{R}^3 .

$$P(7, 2, 3) \quad , \quad Q(3, -2, 1) \quad , \quad R(4, 0, 9)$$



Let $T_A : \mathbb{R}^3 \rightarrow \mathbb{R}^3$ such that

$$T(x) = Ax$$

denote a *matrix transformation* with *standard matrix* A . The *standard matrix* required to rotate a point *anti-clockwise* about the positive y -axis through an angle of 180° is given as

$$A = \begin{pmatrix} -1 & 0 & 0 \\ 0 & 1 & 0 \\ 0 & 0 & -1 \end{pmatrix}$$

Rotate the triangle PQR using A .

30 marks