

Books, watches, notes or cell phones are **not** allowed. The **only** calculators allowed are the Sharp EL-531\*\*\*. You **must** show all your work, the correct answer is worth 1 mark the remaining marks are given for the work.

**Question 1.** (5 marks) Let  $A$  and  $B$  be  $2 \times 2$  matrices, where  $\det(A) = 3$  and  $\det(B) = 5$ . Find  $\det(B^T A^{-3} \text{adj}(A)(2AB)^2)$ .

**Questions 2.** Given the linear system 
$$\begin{cases} -2x_1 + 3x_2 + 2x_3 = 1 \\ x_1 - x_2 + 4x_3 = 2 \\ -3x_1 + 2x_2 + x_3 = 5 \end{cases}$$

a. (3 marks) Find the first column of the adjoint of the coefficient matrix of the above system.

b. (4 marks) Find  $x_2$  of the above system only by using Cramer's Rule.