

Last Name: SOLUTIONS

First Name: _____

Student ID: _____

Quiz 6 (B)

Question 1. (5 marks)

Given $\det \begin{bmatrix} a & b & c \\ d & e & f \\ g & h & i \end{bmatrix} = 12$ find $\det \begin{bmatrix} d-2a & e-2b & f-2c \\ 4a & 4b & 4c \\ g & h & i \end{bmatrix}$

$$B = \begin{bmatrix} d-2a & e-2b & f-2c \\ 4a & 4b & 4c \\ g & h & i \end{bmatrix} \xrightarrow{R_2 \cdot \frac{1}{4}} \begin{bmatrix} d-2a & e-2b & f-2c \\ a & b & c \\ g & h & i \end{bmatrix} \xrightarrow{R_1 + 2R_2}$$

$$\begin{bmatrix} d & e & f \\ a & b & c \\ g & h & i \end{bmatrix} \xrightarrow{R_1 \leftrightarrow R_2} \begin{bmatrix} a & b & c \\ d & e & f \\ g & h & i \end{bmatrix} = A \quad - \frac{1}{4} \det B = \det A$$

$$\det B = -4(12) = -48$$

Question 2. (2 marks) Solve for x:

$$\det \begin{bmatrix} x & 1 & x^2 \\ 3 & 1 & 9 \\ 4 & -1 & -4 \end{bmatrix} = 0 \quad \det \begin{bmatrix} x & 1 & x^2 \\ 3 & 1 & 9 \\ 4 & -1 & -4 \end{bmatrix} = -4x + 36 - 3x^2 - 4x^2 + 9x + 12$$

$$= -7x^2 + 5x + 48$$

$$x = \frac{-(-5) \pm \sqrt{(-5)^2 - 4(-7)(48)}}{2(-7)} = \frac{-5 \pm 37}{-14} = -\frac{16}{7}, 3$$

Question 3. (3 marks) Clearly graph the point $P(2, -4, 2)$ on the right-handed coordinate system.

