

Last Name: SOLUTIONS

First Name: _____

Student ID: _____

Quiz 6 (A)

Question 1. (5 marks)

Given $\det \begin{bmatrix} a & b & c \\ d & e & f \\ g & h & i \end{bmatrix} = 14$ find $\det \begin{bmatrix} g & h & i \\ d+2a & e+2b & f+2c \\ 3a & 3b & 3c \end{bmatrix}$

$\begin{bmatrix} g & h & i \\ d+2a & e+2b & f+2c \\ 3a & 3b & 3c \end{bmatrix} \xrightarrow{R_3 \cdot \frac{1}{3}} \begin{bmatrix} g & h & i \\ d+2a & e+2b & f+2c \\ a & b & c \end{bmatrix} \xrightarrow{R_2 - 2R_3} \begin{bmatrix} g & h & i \\ d & e & f \\ a & b & c \end{bmatrix}$

$R_1 \leftrightarrow R_3 \begin{bmatrix} a & b & c \\ d & e & f \\ g & h & i \end{bmatrix}$

now

$-\frac{1}{3} \det B = \det A$

$\therefore \det B = -3(14) = -42$

Question 2. (2 marks) Solve for x:

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

~~$\det \begin{bmatrix} x & 1 & x^2 \\ 2 & 1 & 4 \\ 3 & -1 & -9 \end{bmatrix} = -9x + 12 - 2x^2 - 3x^2 + 4x + 18 = -5x^2 - 5x + 30$~~

$x = \frac{-(-5) \pm \sqrt{(-5)^2 - 4(-5)(30)}}{2(-5)} = \frac{5 \pm 25}{-10} = -3, 2$

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

