

## Precalculus Worksheet #5 Chapter 9 Selected Solutions

Evaluate each of the following determinants. Show your work neatly organized.

$$\begin{aligned}
 4. \quad & \begin{vmatrix} 4 & -5 & 1 \\ 3 & -2 & 2 \\ -3 & 1 & 3 \end{vmatrix} = \underline{\underline{40}} \\
 & = (+1)(4) \begin{vmatrix} -2 & 2 \\ 1 & 3 \end{vmatrix} + (-1)(-5) \begin{vmatrix} 3 & 2 \\ -3 & 3 \end{vmatrix} + (+1)(1) \begin{vmatrix} 3 & -2 \\ -3 & 1 \end{vmatrix} = \\
 & = (4)[-6 - 2] + (5)[9 - -6] + (1)[3 - 6] = \\
 & = (4)(-8) + (5)(15) + (1)(-3) = -32 + 75 + -3 = 40
 \end{aligned}$$

Use Cramer's rule to solve the following system.

$$\begin{aligned}
 8. \quad & \begin{cases} x + 3y - z = -4 \\ 2x - 2y + z = 9 \\ -2x + y - 3z = -14 \end{cases} & D = \begin{vmatrix} 1 & 3 & -1 \\ 2 & -2 & 1 \\ -2 & 1 & -3 \end{vmatrix} = 19 \\
 D_x = & \begin{vmatrix} -4 & 3 & -1 \\ 9 & -2 & 1 \\ -14 & 1 & -3 \end{vmatrix} = 38 & D_y = \begin{vmatrix} 1 & -4 & -1 \\ 2 & 9 & 1 \\ -2 & -14 & -3 \end{vmatrix} = -19 & D_z = \begin{vmatrix} 1 & 3 & -4 \\ 2 & -2 & 9 \\ -2 & 1 & -14 \end{vmatrix} = 57 \\
 x = \frac{D_x}{D} = & \frac{38}{19} = 2 & y = \frac{D_y}{D} = \frac{-19}{19} = -1 & z = \frac{D_z}{D} = \frac{57}{19} = 3
 \end{aligned}$$

10. Consider the triangular region shown below. Use a determinant to find its area.

