

Precalculus Worksheet #5 Unit 7 Selected Solutions

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

$$4. \begin{vmatrix} 4 & -5 & 1 \\ 3 & -2 & 2 \\ -3 & 1 & 3 \end{vmatrix} = \underline{-40}$$

$$\begin{vmatrix} 4 & -5 & 1 \\ 3 & -2 & 2 \\ -3 & 1 & 3 \end{vmatrix} \xrightarrow{-1R_2 + R_1} \begin{vmatrix} 1 & -3 & -1 \\ 3 & -2 & 2 \\ -3 & 1 & 3 \end{vmatrix} \xrightarrow{\begin{matrix} -3R_1 + R_2 \\ 3R_1 + R_3 \end{matrix}} \begin{vmatrix} 1 & -3 & -1 \\ 0 & 7 & 5 \\ 0 & -8 & 0 \end{vmatrix} = \begin{vmatrix} 7 & 5 \\ -8 & 0 \end{vmatrix} = 0 - (-40) = 40$$

Use Cramer's rule to solve each of the following systems. Show your work neatly organized.

$$7. \begin{cases} 3x + y = 2 \\ 5x + 3y = 3 \end{cases}$$

$$D = \begin{vmatrix} 3 & 1 \\ 5 & 3 \end{vmatrix} = 9 - 5 = 4$$

$$D_x = \begin{vmatrix} 2 & 1 \\ 3 & 3 \end{vmatrix} = 6 - 3 = 3 \qquad x = \frac{D_x}{D} = \frac{3}{4}$$

$$y = \frac{D_y}{D} = \frac{-1}{4}$$

$$D_y = \begin{vmatrix} 3 & 2 \\ 5 & 3 \end{vmatrix} = 9 - 10 = -1$$