3 CHAPTER SUMMARY

BIG IDEAS

For Your Notebook

Big Idea 1

TEKS 2A.3.B

Solving Systems of Equations Using a Variety of Methods

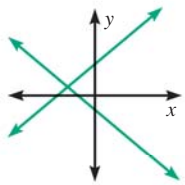
Method	When to use
Graphing: Graph each equation in the system. A point where the graphs intersect is a solution.	The equations have only two variables and are given in a form that is easy to graph.
Substitution: Solve one equation for one of the variables and substitute into the other equation(s).	One of the variables in the system has a coefficient of 1 or −1.
Elimination: Multiply equations by constants, then add the revised equations to eliminate a variable.	None of the variables in the system have a coefficient of 1 or −1.
Cramer's rule: Use determinants to find the solution.	The determinant of the coefficient matrix is not zero.
Inverse matrices: Write the system as a matrix equation $AX = B$. Multiply each side by A^{-1} on the left to obtain the solution $X = A^{-1}B$.	The determinant of the coefficient matrix is not zero.

Big Idea 2

TEKS 2A.3.A

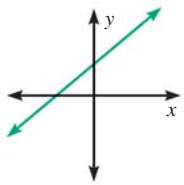
Graphing Systems of Equations and Inequalities

System of equations with 1 solution



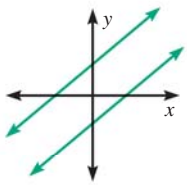
Intersecting lines

System of equations with many solutions



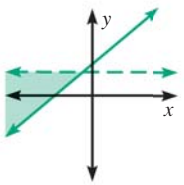
Coinciding lines

System of equations with no solution



Parallel lines

System of inequalities



Shaded region

Big Idea 3

TEKS a.2

Using Matrices

Addition, subtraction, and scalar multiplication	Matrix multiplication	Inverse matrices
$\begin{bmatrix} a & b \\ c & d \end{bmatrix} + \begin{bmatrix} e & f \\ g & h \end{bmatrix} = \begin{bmatrix} a+e & b+f \\ c+g & d+h \end{bmatrix}$ $\begin{bmatrix} a & b \\ c & d \end{bmatrix} - \begin{bmatrix} e & f \\ g & h \end{bmatrix} = \begin{bmatrix} a-e & b-f \\ c-g & d-h \end{bmatrix}$ $k\begin{bmatrix} a & b \\ c & d \end{bmatrix} = \begin{bmatrix} ka & kb \\ kc & kd \end{bmatrix}$	$\begin{bmatrix} a & b \\ c & d \end{bmatrix}\begin{bmatrix} e & f \\ g & h \end{bmatrix} =$ $\begin{bmatrix} ae+bg & af+bh \\ ce+dg & cf+dh \end{bmatrix}$	If $A = \begin{bmatrix} a & b \\ c & d \end{bmatrix}$, then $A^{-1} = \frac{1}{\lvert A \rvert}\begin{bmatrix} d & -b \\ -c & a \end{bmatrix}$ or $A^{-1} = \frac{1}{ad-cb}\begin{bmatrix} d & -b \\ -c & a \end{bmatrix}$.