

Parent Guide for Student Success

For use with Chapter 4

Chapter Overview One way that you can help your student succeed in Chapter 4 is by discussing the lesson goals in the chart below. When a lesson is completed, ask your student to interpret the lesson goals for you and to explain how the mathematics of the lesson relates to one of the key applications listed in the chart.

<i>Lesson Title</i>	<i>Lesson Goals</i>	<i>Key Applications</i>
4.1: Matrix Operations	Add and subtract matrices, multiply a matrix by a scalar, and solve matrix equations. Use matrices in real-life situations.	<ul style="list-style-type: none"> • Health Care • College Costs • PSAT Scores
4.2: Multiplying Matrices	Multiply two matrices and use matrix multiplication in real-life situations.	<ul style="list-style-type: none"> • Softball Equipment • Agriculture • Class Debate
4.3: Determinants and Cramer's Rule	Evaluate determinants of 2×2 and 3×3 matrices. Use Cramer's Rule to solve systems of linear equations.	<ul style="list-style-type: none"> • Bermuda Triangle • Atomic Weights • Sailing
4.4: Identity and Inverse Matrices	Find and use inverse matrices and use inverse matrices in real-life situations.	<ul style="list-style-type: none"> • Cryptography • Travel
4.5: Solving Systems Using Inverse Matrices	Solve systems of linear equations using inverse matrices. Use systems of linear equations to solve real-life problems.	<ul style="list-style-type: none"> • Investing • Dental Fillings • Walkway Lighting

Study Strategy

Writing Out the Steps is the study strategy featured in Chapter 4 (see page 198). Encourage your student to record all steps on assignments since this helps to prevent errors and makes it easier to find and correct mistakes that do occur. When an answer is incorrect, you may be able to help your student in identifying the mistake and deciding how to correct the steps.

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Key Ideas Your student can demonstrate understanding of key concepts by working through the following exercises with you.

Lesson	Exercise																														
4.1	<p>The matrices show the amount the Marshall family spent on gas and electricity each season this year and last year. Write a matrix that shows how much more they spent on gas and electricity per season this year than last year.</p> <table style="margin-left: auto; margin-right: auto;"> <thead> <tr> <th></th> <th colspan="2">This Year</th> <th colspan="2">Last Year</th> </tr> <tr> <th></th> <th>Gas</th> <th>Electricity</th> <th>Gas</th> <th>Electricity</th> </tr> </thead> <tbody> <tr> <td>Summer</td> <td>24</td> <td>324</td> <td>18</td> <td>297</td> </tr> <tr> <td>Fall</td> <td>192</td> <td>165</td> <td>177</td> <td>153</td> </tr> <tr> <td>Winter</td> <td>357</td> <td>126</td> <td>330</td> <td>108</td> </tr> <tr> <td>Spring</td> <td>129</td> <td>186</td> <td>120</td> <td>177</td> </tr> </tbody> </table>		This Year		Last Year			Gas	Electricity	Gas	Electricity	Summer	24	324	18	297	Fall	192	165	177	153	Winter	357	126	330	108	Spring	129	186	120	177
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4.2	Let $A = \begin{bmatrix} 3 & -1 \\ 4 & 2 \end{bmatrix}$ and $B = \begin{bmatrix} -2 & 5 \\ 1 & 0 \end{bmatrix}$. Find $2AB$.																														
4.3	Evaluate the determinant of the coefficient matrix. $7x - 2y = 5$ $3x - 5y = 6$																														
4.4	Find the inverse of the matrix. $\begin{bmatrix} 1 & 8 \\ 0 & 4 \end{bmatrix}$																														
4.5	Your club is planning a craft sale as a fundraiser. Members plan to make and sell two types of craft items. It takes 5 hours to make one item of the first type and the materials for one item cost \$2.50. It takes 3 hours to make one item of the second type and the materials for one item cost \$4. The club has a total of \$120 to spend on materials and members have pledged a total of 140 hours of labor. Use an inverse matrix to determine how many of each type of craft your club should make in order to use all the money and time available.																														

Home Involvement Activity

Directions: Make up a code using matrix inverses as shown in Lesson 4.4. Write messages to each other in your code. Decode each other's messages.

Answers

$$4.1: \begin{bmatrix} 6 & 15 & 12 & 18 & 27 \\ 9 & 27 & 18 & 27 & 9 \end{bmatrix}$$

$$4.2: \begin{bmatrix} -14 & 30 \\ -12 & 40 \end{bmatrix}$$

$$4.3: -29$$

$$4.4: \begin{bmatrix} 1 & -2 \\ 0 & \frac{1}{4} \end{bmatrix}$$

$$4.5: 16 \text{ of first and } 20 \text{ of second}$$