Name_____ Date _____

2.5 Systems of Linear Equations

For use with Activity 2.5

Essential Question How can you solve a system of linear equations?

1 ACTIVITY: Writing a System of Linear Equations

Work with a partner.

Your family starts a bed-and-breakfast in your home. You spend $500 fixing up a bedroom to rent. Your cost for food and utilities is $10 per night. Your family charges $60 per night to rent the bedroom.

a. Write an equation that represents your costs.

Cost, C (in dollars)	=	$10 per night	•	Number of nights, x	+	$500

b. Write an equation that represents your revenue (income).

Revenue, R (in dollars)	=	$60 per night	•	Number of nights, x

c. A set of two (or more) linear equations is called a **system of linear equations**. Write the system of linear equations for this problem.

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2 ACTIVITY: Using a Table to Solve a System

Use the cost and revenue equations from Activity 1 to find how many nights you need to rent the bedroom before you recover the cost of fixing up the bedroom. This is the *break-even point* for your business.

a. Complete the table.

x	0	1	2	3	4	5	6	7	8	9	10	11
C												
R												

b. How many nights do you need to rent the bedroom before you break even?

3 ACTIVITY: Using a Graph to Solve a System

a. Graph the cost equation from Activity 1.

b. In the same coordinate plane, graph the revenue equation from Activity 1.

c. Find the point of intersection of the two graphs. The x-value of this point is the number of nights you need to rent the bedroom to break even.