EXAMPLE 4 TAKS REASONING: Multi-Step Problem

STICKERS You are designing a sticker to advertise your band. A company charges $225 for the first 1000 stickers and $80 for each additional 1000 stickers. Write an equation that gives the total cost (in dollars) of stickers as a function of the number (in thousands) of stickers ordered. Find the cost of 9000 stickers.

Solution

STEP 1 **Identify** the rate of change and a data pair. Let C be the cost (in dollars) and s be the number of stickers (in thousands).

Rate of change, m: $80 per 1 thousand stickers
Data pair (s_1, C_1): (1 thousand stickers, $225)

STEP 2 **Write** an equation using point-slope form. Rewrite the equation in slope-intercept form so that cost is a function of the number of stickers.

$C - C_1 = m(s - s_1)$ Write point-slope form.

$C - 225 = 80(s - 1)$ Substitute 80 for m, 1 for s_1, and 225 for C_1.

$C = 80s + 145$ Solve for C.

AVOID ERRORS
Remember that s is given in thousands. To find the cost of 9000 stickers, substitute 9 for s.

STEP 3 **Find** the cost of 9000 stickers.

$C = 80(9) + 145 = 865$ Substitute 9 for s. Simplify.

▶ The cost of 9000 stickers is $865.

EXAMPLE 5 Write a real-world linear model from a table

WORKING RANCH The table shows the cost of visiting a working ranch for one day and night for different numbers of people. Can the situation be modeled by a linear equation? *Explain*. If possible, write an equation that gives the cost as a function of the number of people in the group.

Number of people	4	6	8	10	12
Cost (dollars)	250	350	450	550	650

Solution

STEP 1 **Find** the rate of change for consecutive data pairs in the table.

$$\frac{350 - 250}{6 - 4} = 50, \quad \frac{450 - 350}{8 - 6} = 50, \quad \frac{550 - 450}{10 - 8} = 50, \quad \frac{650 - 550}{12 - 10} = 50$$

Because the cost increases at a constant rate of $50 per person, the situation can be modeled by a linear equation.

STEP 2 **Use** point-slope form to write the equation. Let C be the cost (in dollars) and p be the number of people. Use the data pair (4, 250).

$C - C_1 = m(p - p_1)$ Write point-slope form.

$C - 250 = 50(p - 4)$ Substitute 50 for m, 4 for p_1, and 250 for C_1.

$C = 50p + 50$ Solve for C.