SUBTRACTING POLYNOMIALS To subtract a polynomial, add its opposite. To find the opposite of a polynomial, multiply each of its terms by -1.

EXAMPLE 4 Subtract polynomials

Find the difference.

a. $(4n^2 + 5) - (-2n^2 + 2n - 4)$ **b.** $(4x^2 - 3x + 5) - (3x^2 - x - 8)$

Solution

a.
$$\begin{array}{r} (4n^2 \quad + 5) \\ -(-2n^2 + 2n - 4) \\ \hline \end{array} \longrightarrow \begin{array}{r} 4n^2 \quad + 5 \\ +\,2n^2 - 2n + 4 \\ \hline 6n^2 - 2n + 9 \end{array}$$

AVOID ERRORS Remember to multiply *each* term in the polynomial by -1 when you write the subtraction as addition.

b. $(4x^2 - 3x + 5) - (3x^2 - x - 8) = 4x^2 - 3x + 5 - 3x^2 + x + 8$

$= (4x^2 - 3x^2) + (-3x + x) + (5 + 8)$

$= x^2 - 2x + 13$

EXAMPLE 5 TAKS REASONING: Multi-Step Problem

BASEBALL ATTENDANCE Major League Baseball teams are divided into two leagues. During the period 1995–2001, the attendance N and A (in thousands) at National and American League baseball games, respectively, can be modeled by

$N = -488t^2 + 5430t + 24{,}700$ and

$A = -318t^2 + 3040t + 25{,}600$

where t is the number of years since 1995. About how many people attended Major League Baseball games in 2001?

Solution

STEP 1 **Add** the models for the attendance in each league to find a model for M, the total attendance (in thousands).

$M = (-488t^2 + 5430t + 24{,}700) + (-318t^2 + 3040t + 25{,}600)$

$= (-488t^2 - 318t^2) + (5430t + 3040t) + (24{,}700 + 25{,}600)$

$= -806t^2 + 8470t + 50{,}300$

AVOID ERRORS Because a value of M represents *thousands* of people, $M \approx 72{,}100$ represents 72,100,000 people.

STEP 2 **Substitute** 6 for t in the model, because 2001 is 6 years after 1995.

$M = -806(6)^2 + 8470(6) + 50{,}300 \approx 72{,}100$

▶ About 72,100,000 people attended Major League Baseball games in 2001.

GUIDED PRACTICE for Examples 4 and 5

4. Find the difference $(4x^2 - 7x) - (5x^2 + 4x - 9)$.

5. **BASEBALL ATTENDANCE** Look back at Example 5. Find the difference in attendance at National and American League baseball games in 2001.