BINOMIALS AND TRINOMIALS A polynomial with two terms is called a **binomial**. A polynomial with three terms is called a **trinomial**.

EXAMPLE 2 Identify and classify polynomials

Tell whether the expression is a polynomial. If it is a polynomial, find its degree and classify it by the number of its terms. Otherwise, tell why it is not a polynomial.

	Expression	Is it a polynomial?	Classify by degree and number of terms
a.	9	Yes	0 degree monomial
b.	$2x^2 + x - 5$	Yes	2nd degree trinomial
c.	$6n^4 - 8^n$	No; variable exponent	
d.	$n^{-2} - 3$	No; negative exponent	
e.	$7bc^3 + 4b^4c$	Yes	5th degree binomial

ADDING POLYNOMIALS To add polynomials, add like terms. You can use a vertical or a horizontal format.

EXAMPLE 3 Add polynomials

Find the sum.

a. $(2x^3 - 5x^2 + x) + (2x^2 + x^3 - 1)$ **b.** $(3x^2 + x - 6) + (x^2 + 4x + 10)$

Solution

ALIGN TERMS
If a particular power of the variable appears in one polynomial but not the other, leave a space in that column, or write the term with a coefficient of 0.

a. Vertical format: Align like terms in vertical columns.

$$\begin{array}{r} 2x^3 - 5x^2 + x \\ +\quad x^3 + 2x^2 \quad\quad - 1 \\ \hline 3x^3 - 3x^2 + x - 1 \end{array}$$

b. Horizontal format: Group like terms and simplify.

$$(3x^2 + x - 6) + (x^2 + 4x + 10) = (3x^2 + x^2) + (x + 4x) + (-6 + 10)$$
$$= 4x^2 + 5x + 4$$

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GUIDED PRACTICE for Examples 1, 2, and 3

1. Write $5y - 2y^2 + 9$ so that the exponents decrease from left to right. Identify the degree and leading coefficient of the polynomial.
2. Tell whether $y^3 - 4y + 3$ is a polynomial. If it is a polynomial, find its degree and classify it by the number of its terms. Otherwise, tell why it is not a polynomial.
3. Find the sum $(5x^3 + 4x - 2x) + (4x^2 + 3x^3 - 6)$.