

## Add and Subtract Polynomials

<b>Polynomial</b>	a monomial or a sum of monomials
<b>Like Terms</b>	terms that have the same variable(s) raised to the same power(s)

To add or subtract polynomials, perform the indicated operations and combine like terms.

**Example 1** Simplify  $-6rs + 18r^2 - 5s^2 - 14r^2 + 8rs - 6s^2$ .

$$\begin{aligned} & -6rs + 18r^2 - 5s^2 - 14r^2 + 8rs - 6s^2 \\ & = (18r^2 - 14r^2) + (-6rs + 8rs) + (-5s^2 - 6s^2) && \text{Group like terms.} \\ & = 4r^2 + 2rs - 11s^2 && \text{Combine like terms.} \end{aligned}$$

**Example 2** Simplify  $4xy^2 + 12xy - 7x^2y - (20xy + 5xy^2 - 8x^2y)$ .

$$\begin{aligned} & 4xy^2 + 12xy - 7x^2y - (20xy + 5xy^2 - 8x^2y) \\ & = 4xy^2 + 12xy - 7x^2y - 20xy - 5xy^2 + 8x^2y && \text{Distribute the minus sign.} \\ & = (-7x^2y + 8x^2y) + (4xy^2 - 5xy^2) + (12xy - 20xy) && \text{Group like terms.} \\ & = x^2y - xy^2 - 8xy && \text{Combine like terms.} \end{aligned}$$

### Exercises

Simplify.

1.  $(6x^2 - 3x + 2) - (4x^2 + x - 3)$

2.  $(7y^2 + 12xy - 5x^2) + (6xy - 4y^2 - 3x^2)$

3.  $(-4m^2 - 6m) - (6m + 4m^2)$

4.  $27x^2 - 5y^2 + 12y^2 - 14x^2$

5.  $(18p^2 + 11pq - 6q^2) - (15p^2 - 3pq + 4q^2)$

6.  $17j^2 - 12k^2 + 3j^2 - 15j^2 + 14k^2$

7.  $(8m^2 - 7n^2) - (n^2 - 12m^2)$

8.  $14bc + 6b - 4c + 8b - 8c + 8bc$

9.  $6r^2s + 11rs^2 + 3r^2s - 7rs^2 + 15r^2s - 9rs^2$

10.  $-9xy + 11x^2 - 14y^2 - (6y^2 - 5xy - 3x^2)$

11.  $(12xy - 8x + 3y) + (15x - 7y - 8xy)$

12.  $10.8b^2 - 5.7b + 7.2 - (2.9b^2 - 4.6b - 3.1)$

13.  $(3bc - 9b^2 - 6c^2) + (4c^2 - b^2 + 5bc)$

14.  $11x^2 + 4y^2 + 6xy + 3y^2 - 5xy - 10x^2$

15.  $\frac{1}{4}x^2 - \frac{3}{8}xy + \frac{1}{2}y^2 - \frac{1}{2}xy + \frac{1}{4}y^2 - \frac{3}{8}x^2$

16.  $24p^3 - 15p^2 + 3p - 15p^3 + 13p^2 - 7p$