

Challenge: Skills and Applications

For use with pages 584–589

In Exercises 1–6, find the product.

- $(2y^3 - 5y)(4y^2 + 3)$
- $(7 - a^3)(3a^4 - 2)$
- $(6c^4 - d^2)(2c^4 + d^2)$
- $2x(x^2 + 8)(3x^2 + 5)$
- $(5a^2 - 3b^2)(a^2 - 9b^2)$
- $(x - 3)(x - 4)(x + 2)$

In Exercises 7–9, simplify by multiplying and then adding and subtracting. Write the result as a polynomial in standard form.

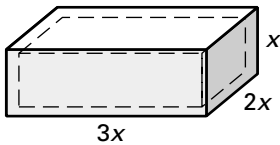
- $(3x + 1)(x + 5) + x^2(x - 4)$
- $(3x - 6)(3x + 6) + 2x(7 - x^2)$
- $(x^2 + 3)(x^2 - 5) + x^3(x - 9)$
- Suppose $(x + a)(x + b) = x^2 + (b - 6)x + 180$. Find the values of a and b .

In Exercises 11–12, solve the equation.

- $c(3c + 2) - 3(c^2 + 4c - 17) = 1$
- $6r^2 + 5r = 2(r^2 + 2) - 4(5 - r^2) + 1$

In Exercises 13–15, use the following information.

A jewelry box is made from wood that is $\frac{1}{2}$ inch thick.
The length of the box is $3x$, the width is $2x$, and the height is x .



- The space inside the box (dashed in the diagram) is a rectangular solid. Write an expression for the length, the width, and the height of this space in terms of x .
- Write a polynomial in standard form that represents the volume of the space inside the box.
- If the shortest side (x) is 4 inches, what is the volume of the space inside the box?