

13-4 Multiplying a Polynomial by a Monomial

(Pages 683–686)

You can use the distributive property to multiply a polynomial by a monomial.

Examples

Find each product.

a. $5(x^2 + 2x + 1)$

$$\begin{aligned} 5(x^2 + 2x + 1) &= 5(x^2) + 5(2x) + 5(1) && \text{Distributive Property} \\ &= 5x^2 + 10x + 5 && \text{Multiply.} \end{aligned}$$

b. $3d(2d - 8)$

$$\begin{aligned} 3d(2d - 8) &= 3d(2d) - 3d(8) && \text{Distributive Property} \\ &= 6d^2 - 24d && \text{Multiply monomials.} \end{aligned}$$

Try These Together

Find each product.

1. $6(2x + 3)$

2. $4(z + 4)$

3. $2x(x^2 + 3x - 5)$

HINT: Use the Distributive Property to multiply every term in the polynomial by the monomial.

Practice

Find each product.

4. $2z(z - 4)$

5. $-5v(1 + v)$

6. $m(m - 6)$

7. $5b(-12 + 2b)$

8. $-2x(3x - 7x)$

9. $x(y^2 + z)$

10. $-2x(4 - 4y + 6y^2)$

11. $3b(b^3 + b^2 + 5)$

12. $-5x(2x^3 + 2x^2 - 4)$

13. $3d(d^4 + 5d^3 + 6)$

14. $s(s^2 - 2s^3 + 7)$

15. $7(-8x + 5x^2 + y^2)$

Solve each equation.

16. $6(2z + 10) + 8 = 5z + 5$

17. $-3(x - 4) = 4x + 8$

18. $2(6y - 11) = 5y + 3$

19. $5(-2x + 8) = -6x + 20$

20. **Woodshop** Devonte is making a wooden box for a project in woodshop. The base of the box has width x inches and length $x + 5$ inches. What polynomial represents the area of the base of the box?

21. **Standardized Test Practice** Find the product of a and $a + b + c^2$.

A $a + ab + ac$

B $a^2 + ab + ac$

C $a^2 + ab + ac^2$

D $a + b^2 + ac$

Answers: 1. $12x + 18$ 2. $4z + 16$ 3. $2x^3 + 6x^2 - 10x$ 4. $2z^2 - 8z - 5v$ 5. $-5v - 5v^2$ 6. $m^2 - 6m$ 7. $-60b + 10b^2$ 8. $8x^2$ 9. $xy^2 + xz$ 10. $-8x + 8xy - 12xy^2$ 11. $3b^4 + 3b^3 + 15b$ 12. $-10x^4 - 10x^3 + 20x$ 13. $3d^5 + 15d^4 + 18d$ 14. $s^3 - 2s^4 + 7s$ 15. $-56x + 35x^2 + 7y^2$ 16. -9 17. $\frac{7}{4}$ 18. $3\frac{3}{4}$ 19. 5 20. $x^2 + 5x$ 21. **C**