

9.2 Multiply Polynomials

Distributive Property

$$5(2x^3 + 5x^2 - 8x + 7)$$

$$10x^3 + 25x^2 - 40x + 35$$

$$3x(x^2 - 4x + 2)$$

$$3x^3 - 12x^2 + 6x$$

$$\begin{aligned} 2x^3 \cdot 3x^2 \\ 2 \cdot x^3 \cdot 3 \cdot x^2 \\ 6x^5 \end{aligned}$$

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

Find the product.

Practice

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

$$3x^3 - 2x^2 + x$$

2. $2y(3y^3 + y^2 - 4)$

$$6y^4 + 2y^3 - 8y$$

4. $d^2(4d^2 - 3d + 1)$

$$4d^4 - 3d^3 + d^2$$

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

$$-w^5 - 3w^4$$

Multiply Polynomials

$(4x - 3)(2x^2 + 5x - 1)$
 $8x^3 + 20x^2 - 4x - 6x^2 - 15x + 3$

1) Distribute
 2) Combine like terms

$$8x^3 + 14x^2 - 19x + 3$$

Practice

13. $(y + 8)(y - 3)$
 $y^2 - 3y + 8y - 24$
 $y^2 + 5y - 24$

14. $(n + 5)(n + 6)$
 $n^2 + 6n + 5n + 30$
 $n^2 + 11n + 30$

17. $(w + 1)(w^2 + 2w + 1)$
 $w^3 + 2w^2 + w + w^2 + 2w + 1$
 $w^3 + 3w^2 + 3w + 1$

18. $(m - 2)(m^2 - 2m + 3)$
 $m^3 - 2m^2 + 3m - 2m^2 + 4m - 6$
 $m^3 - 4m^2 + 7m - 6$

Special pattern for multiplying binomials

$$(2x + 3)(4x + 1)$$

$$8x^2 + 2x + 12x + 3$$

F O I L

$$8x^2 + 14x + 3$$

FOIL
 i's, u'tter, h'er, a'st

Find the product $(3a + 4)(a - 2)$.

$$3a^2 - 6a + 4a - 8$$

$$3a^2 - 2a - 8$$

Practice

19. $(y - 3)(8y + 1)$

$$8y^2 - 23y - 3$$

23. $(6x - 2)(x + 4)$

$$6x^2 + 22x - 8$$

26. $(8p - 3)(2p - 5)$

$$16p^2 - 40p - 6p + 15$$

$$16p^2 - 46p + 15$$

20. $(5b - 1)(3b + 2)$

$$15b^2 + 7b - 2$$

24. $(2s - 5)(s + 3)$

$$2s^2 + s - 15$$

27. $(14t - 2)(t + 2)$

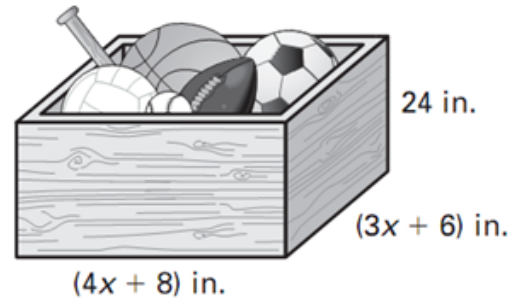
$$14t^2 + 28t - 2t - 4$$

$$14t^2 + 26t - 4$$

Practice

Volume You have come up with a plan for building a wooden box to hold all of your sports equipment as shown.

- Write a polynomial that represents the volume of the box.
- Find the volume of the box when $x = 10$.



$$17) \quad (x+2)(x+5) - x(4x-1)$$
$$x^2 + 5x + 2x + 10$$

$$x^2 + 7x + 10 - 4x^2 + x$$

$$-3x^2 + 8x + 10$$