Each term of a trinomial like $6x^2 + 7x - 20$ has a standard name. A **quadratic term** is a term of degree two. A **linear term** is a term of degree one. As defined earlier, a *constant term* is one having no variable factor. The trinomial itself is called a **quadratic polynomial** since its term of greatest degree is quadratic.

$6x^2 + 7x - 20$

$6x^2$ is the quadratic term.
$7x$ is the linear term.
-20 is the constant term.

Sometimes you may need to evaluate a quadratic polynomial. The Calculator Key-In on page 203 will help you.

Oral Exercises

For each product, state (a) the quadratic term, (b) the two terms that form the linear term, (c) the constant term, and (d) the trinomial product.

Sample $(n - 7)(2n + 5)$ **Solution** **a.** $2n^2$ **b.** $5n$ and $-14n$ **c.** -35 **d.** $2n^2 - 9n - 35$

1. $(x + 1)(x + 3)$	**2.** $(y + 2)(y + 5)$	**3.** $(t - 2)(t - 3)$
4. $(u - 4)(u - 1)$	**5.** $(s - 6)(s - 3)$	**6.** $(7 - k)(4 - k)$
7. $(y - 3)(y + 5)$	**8.** $(x - 1)(x + 4)$	**9.** $(r + 3)(r - 5)$
10. $(s - 3)(s + 3)$	**11.** $(y + 2)(y + 2)$	**12.** $(x - 7)(x + 5)$
13. $(2y + 3)(y + 1)$	**14.** $(n + 1)(2n + 5)$	**15.** $(x - 3)(2x + 3)$
16. $(3y - 1)(y + 3)$	**17.** $(3r + 1)(r - 2)$	**18.** $(1 - 5x)(5 - x)$

Written Exercises

Write each product as a trinomial.

A

1. $(x + 5)(x + 8)$	**2.** $(x + 7)(x + 6)$	**3.** $(y - 4)(y - 3)$
4. $(c - 9)(c - 6)$	**5.** $(z + 4)(z - 7)$	**6.** $(y + 6)(y - 2)$
7. $(n - 3)(n + 7)$	**8.** $(u - 10)(u + 9)$	**9.** $(3 + z)(2 + z)$
10. $(4 - x)(1 - x)$	**11.** $(2y + 5)(y + 2)$	**12.** $(r + 4)(2r + 3)$
13. $(7x - 1)(x + 7)$	**14.** $(4k - 1)(k + 4)$	**15.** $(2y + 1)(3y + 2)$
16. $(2n + 1)(5n + 2)$	**17.** $(2 - 3s)(1 - 2s)$	**18.** $(3 - 2r)(2 - 3r)$
19. $(3h - 5)(2h + 1)$	**20.** $(3x + 2)(2x - 3)$	**21.** $(5n + 4)(4n - 5)$

Sample 1 $(3x - 5y)(4x + y) = 12x^2 + (3xy - 20xy) - 5y^2$
$= 12x^2 - 17xy - 5y^2$ ***Answer***

Write each product as a trinomial. See Sample 1 on page 201.

B

22. $(a + 2b)(a - b)$ **23.** $(3x - y)(x - 2y)$ **24.** $(2r - s)(3r + 2s)$

25. $(4h - k)(2h + 3k)$ **26.** $(2x + 5y)(2x - 3y)$ **27.** $(7a - 2b)(5a - 3b)$

Sample 2 $(m^2 - 5m)(2m^2 + 4m) = (m^2)(2m^2) + (m^2)(4m) + (-5m)(2m^2) + (-5m)(4m)$
$= 2m^4 + 4m^3 - 10m^3 - 20m^2$
$= 2m^4 - 6m^3 - 20m^2$ ***Answer***

28. $(x^2 - 4x)(3x^2 + 2x)$ **29.** $(a^2 + 3b)(3a^2 - b)$ **30.** $(p^2 - q^2)(p^2 + 3q^2)$

31. $(p^3 - 4q^3)(p^3 + 3q^3)$ **32.** $(y^4 - 3y^2)(y^2 + 2)$ **33.** $(x^4 + x^2y^2)(4x^2 - y^2)$

Sample 3 $n(n - 3)(2n + 1) = n[2n^2 + (-6n + n) - 3]$
$= n[2n^2 - 5n - 3]$
$= 2n^3 - 5n^2 - 3n$ ***Answer***

34. $y(2y - 1)(y + 4)$ **35.** $y(4y + 3)(y - 2)$

36. $y^2(1 - 2y)(2 + 3y)$ **37.** $x^2(4 - x)(2 - 3x)$

Solve.

Sample 4 $(x - 4)(x + 9) = (x + 5)(x - 3)$

Solution $x^2 - 4x + 9x - 36 = x^2 + 5x - 3x - 15$
$x^2 + 5x - 36 = x^2 + 2x - 15$
$5x - 36 = 2x - 15$
$3x - 36 = -15$
$3x = 21$
$x = 7$

$\therefore$ the solution set is $\{7\}$. ***Answer***

38. $(x - 2)(x - 3) = (x - 7)(x + 3)$ **39.** $(y + 4)(y - 3) = (y - 2)(y + 5)$

40. $(2n + 5)(3n - 4) = (n + 2)(6n - 7)$ **41.** $(2x - 1)(8x + 3) = (4x + 5)(4x - 5)$

42. $(n + 3)(2n + 3) = (n + 2)^2 + (n - 2)^2$ **43.** $(2x - 3)(x + 3) = (x - 3)^2 + (x + 3)^2$

44. Show that $(ax + b)(cx + d) = acx^2 + (ad + bc)x + bd$.

In Exercises 45 and 46, find the values of p, q, and r.

C

45. $(px + q)(2x + 5) = 6x^2 + 11x + r$ **46.** $(px + 2)(3x + q) = rx^2 + x - 2$

Write each product as a trinomial. Assume that n represents a positive integer.

47. $(x^n - y^n)(2x^n + 3y^n)$ **48.** $(2x^n - y^n)(2x^n + y^n)$

49. Show that the square of any odd integer is odd. (*Hint:* If n is an integer, then $2n$ is an even integer and $2n + 1$ is an odd integer.)