

1.  $3(2a + 5b) = 6a + 15b$
2.  $(-2)(9c - d) = -18c + 2d$
3.  $(-n)(-n + 8) = n^2 - 8n$
4.  $-5(7v - 9w) = -35v + 45w$
5.  $-c(-a + b - c) = ac - bc + c^2$
6.  $2p(p^2 - 1.5p - 4) = 2p^3 - 3p^2 - 8p$
7.  $(8s + 3t)3u = 24su + 9tu$
8.  $(-x - y + z - 1)(-1) = x + y - z + 1$
9.  $(e + 2f - 6)ef = e^2f + 2ef^2 - 6ef$
10.  $3uv^2(u^4 - 3u^2v^2 - 2v^4) = 3u^5v^2 - 9u^3v^4 - 6uv^6$
11.  $4(a + 2b) + 3(a - 3b) = 4a + 8b + 3a - 9b = 7a - b$
12.  $d(c - 11) - c(d - 9) = cd - 11d - cd + 9c = 9c - 11d$
13.  $x - 5y - 8(x - y + z) = x - 5y - 8x + 8y - 8z = -7x + 3y - 8z$
14.  $n^2 - n(n + 5) - 6(1 - n) = n^2 - n^2 - 5n - 6 + 6n = n - 6$
15.  $2(3u - v) - 3(2u + v) = 6u - 2v - 6u - 3v = -5v$
16.  $p(q - r) - q(p - r) - r(-p + q)$   
 $= pq - pr - pq + qr + pr - qr$   
 $= 0$
17.  $(a + b)(c + d) = ac + ad + bc + bd$
18.  $(x + 4)(x + y) = x^2 + xy + 4x + 4y$
19.  $(t + 2)(t + 5) = t^2 + 5t + 2t + 10 = t^2 + 7t + 10$
20.  $(e + f)(g - h) = eg - eh + fg - fh$
21.  $(a - b)(c - d) = ac - ad - bc + bd$
22.  $(x - y)(z - 5) = xz - 5x - yz + 5y$
23.  $(k - 2)(k - 4) = k^2 - 4k - 2k + 8 = k^2 - 6k + 8$
24.  $(2c - 7)(4d - 1) = 8cd - 2c - 28d + 7$
25.  $(5v - 3w)(-6w + 5) = -30vw + 25v + 18w^2 - 15w$

26.  $\left(m + \frac{1}{6}\right)\left(4m - \frac{3}{5}n\right)$   
 $= 4m^2 - \frac{3}{5}mn + \frac{4}{6}m - \frac{3}{30}n$   
 $= 4m^2 - \frac{3}{5}mn + \frac{2}{3}m - \frac{1}{10}n$
27.  $(z^2 - 1)(z + 1) = z^3 + z^2 - z - 1$
28.  $(st - 9s)(-st + 9t)$   
 $= -s^2t^2 + 9st^2 + 9s^2t - 81st$   
 $= -s^2t^2 + 9s^2t + 9st^2 - 81st$
29.  $(x - 12)(x + 5) = x^2 + 5x - 12x - 60 = x^2 - 7x - 60$
30.  $(p + 2)(p - 20) = p^2 - 20p + 2p - 40 = p^2 - 18p - 40$
31.  $(a - 2)(a - 9) = a^2 - 9a - 2a + 18 = a^2 - 11a + 18$
32.  $(1 + n)(15 - n) = 15 - n + 15n - n^2 = -n^2 + 14n + 15$
33.  $(r - 6)(r - 6) = r^2 - 6r - 6r + 36 = r^2 - 12r + 36$
34.  $(y - 3)(y + 4) = y^2 + 4y - 3y - 12 = y^2 + y - 12$
35.  $(a - b)(a + b)(x - y)$   
 $= (a^2 + ab - ab - b^2)(x - y)$   
 $= (a^2 - b^2)(x - y)$   
 $= a^2x - a^2y - b^2x + b^2y$
36.  $(k + 1)(k + 2)(k + 3)$   
 $= (k^2 + 2k + k + 2)(k + 3)$   
 $= (k^2 + 3k + 2)(k + 3)$   
 $= k^3 + 3k^2 + 3k^2 + 9k + 2k + 6$   
 $= k^3 + 6k^2 + 11k + 6$
37.  $(a + b)(a + 2b) + (a - b)(a - 2b)$   
 $= a^2 + 2ab + ab + 2b^2 + a^2 - 2ab - ab + 2b$   
 $= 2a^2 + 4b^2$
38.  $(x + 4)(x + 5) - 2x(x + 7)$   
 $= x^2 + 5x + 4x + 20 - 2x^2 - 14x$   
 $= -x^2 - 5x + 20$
39.  $5p(p - 3) - (2p + 1)(p - 8)$   
 $= 5p^2 - 15p - (2p^2 - 16p + p - 8)$   
 $= 5p^2 - 15p - (2p^2 - 15p - 8)$   
 $= 5p^2 - 15p - 2p^2 + 15p + 8$   
 $= 3p^2 + 8$

$$\begin{aligned}
40. \quad & 17r^2 - (4r - 2)(8r - 5) + (3r - 4)(5r + 6) \\
& = 17r^2 - (32r^2 - 20r - 16r + 10) + (15r^2 + 18r - 20r - 24) \\
& = 17r^2 - (32r^2 - 36r + 10) + (15r^2 - 2r - 24) \\
& = 17r^2 - 32r^2 + 36r - 10 + 15r^2 - 2r - 24 \\
& = 34r - 34
\end{aligned}$$

$$\begin{aligned}
41. \quad & 4a^2 - 5(a(2a - 9) - 3(a + 7)) + 6(a - 12)(a + 1) \\
& = 4a^2 - 5(2a^2 - 9a - 3a - 21) + 6(a^2 + a - 12a - 12) \\
& = 4a^2 - 10a^2 + 45a + 15a + 105 + 6a^2 + 6a - 72a - 72 \\
& = -6a + 33
\end{aligned}$$

$$\begin{aligned}
42. \quad & 13x - (-11y - 3(5x - 6y) + 5(2x - 7y) - 26x) - 12y \\
& = 13x - (-11y - 15x + 18y + 10x - 35y - 26x) - 12y \\
& = 13x - (-31x - 28y) - 12y \\
& = 13x + 31x + 28y - 12y \\
& = 44x + 16y
\end{aligned}$$