D24 Arranging Polynomials
Power of a power of a base

Key	
Iams	

It is customary to arrange the letters of a term in alphabetical order ex. $3ax^2y$ not $3x^2ay$

ARRANGE the terms of a polynomial in descending powers of one of the letters (variables) (that appears most frequently)

rearrange $x+4-3x^2+4x^3$ $\quad 4x^3-3x^2+x+4$

$3ax^2y-4bxy^2+7x^3-2ab$ $\quad 7x^3+3ax^2y-4bxy^2-2ab$

(a) $4b^2+3a^2-7ab+14$ (in terms of a) $\quad 3a^2-7ab+4b^2+14$

(b) $3xy-y^2+2x^3-5x^2$ (in terms of x) $\quad 2x^3-5x^2+3xy-y^2$

(c) $3z^2-4-z^2+2z$ $\quad 2z^2+2z-4$

(d) $abc^2+ab^2c+a^2bc$ (in terms of a) $\quad a^2bc+ab^2c+abc^2$

(e) $7c^2-3ac+dc^3+11$ (in terms of c) $\quad c^3d+7c^2-3ac+11$

$(x^2)^3 = x^2\cdot x^2\cdot x^2 = x\cdot x\cdot x\cdot x\cdot x\cdot x = x^{6} = x^{2\cdot 3}$

or

$(x^2)^3 = x^2\cdot x^2\cdot x^2 = x^{2+2+2} = x^{6} = x^{2\cdot 3}$

To find a power of a power of a base
Keep the base and multiply the exponents
$(a^m)^n = a^{m\cdot n}$ (for all positive integers m & n)

(a) $(a^4)^2 = a^8$ (c) $(k^4)^4k^3 = k^{19}$

(b) $(x^a)^b = x^{ab}$ (d) $(b^3)^x(b^x)^4 = b^{7x}$

$(a\cdot b)^3 = (ab)\cdot(ab)\cdot(ab) =$ The associative property lets us remove ( )'s $ab\cdot ab\cdot ab = aaa\cdot bbb = a^3b^3$
The commutative property lets us reorder

To find a power of a product find the power of each factor Then multiply
$(ab)^m = a^m b^m$ (for all positive integers m)

A24 Simplify

Key

Iams

6a. $x^4 \cdot x^7$ ⓐ x^{11}

b. $(x^4)^7$ ⓑ x^{28}

c. $(x^7)^4$ ⓒ x^{28}

10. $(-2t)^5$ ⑩ $-32t^5$

14. $(6x^3)^2$ ⑭ $36x^6$

18. $(2x^2y)^5$ ⑱ $32x^{10}y^5$

22. $(3c)^2(3c)^3$

$9c^2 \quad 27c^3$

$243c^5$ or 3^5c^5 ㉒

26. $(2x^2y^3)^4(-xy^2)^2$

$16x^8y^{12}x^2y^4$

㉖ $16x^{10}y^{16}$

30. $[(-x^3)^2]^3$

$[x^6]^3$

㉚ x^{18}

34. $(a^2)^6 + (-2a^4)^3$

$a^{12} - 8a^{12}$

㉞ $-7a^{12}$

35. $(a^2)^6 \cdot (-2a^4)^3$

$a^{12}(-8a^{12})$

㉟ $-8a^{24}$

38. $(2x)^3(xy)^2 + (2xy)^2(-x)^3$

$8x^3 \cdot x^2y^2 + 4x^2y^2(-x^3)$

$8x^5y^2 - 4x^5y^2$

㊳ $4x^5y^2$

39. $(2x)^3(xy)^2 \cdot (2xy)^2(-x)^3$

$8x^3x^2y^2 \cdot 4x^2y^2(-x^3)$

㊴ $-32x^{10}y^4$

42. $x^n \cdot x^2$ ㊷ x^{n+2}

46. $(a^x)^y \cdot (a^y)^x$

$a^{xy} \cdot a^{xy}$

㊻ a^{2xy}

50. $(t^m)^n \cdot 3(t^n)^m$

$t^{mn} \cdot 3t^{mn}$

㊿ $3t^{2mn}$

19. $2x(x-3) + x(5-x)$

$2x^2 - 6x + 5x - x^2$

⑲ $x^2 - x$

21. $6r^2(2r-1) - 3r(4r^2-5r)$

$12r^3 - 6r^2 - 12r^3 + 15r^2$

㉑ $9r^2$

23. $-[6y - 3(5y-4)]$

$-[6y - 15y + 12]$

$-[-9y + 12]$

㉓ $9y - 12$

25. $a[2a - 3(1-a)] + 5(a - a^2)$

$a[2a - 3 + 3a] + 5a - 5a^2$

$a[5a - 3] + 5a - 5a^2$

$5a^2 - 3a + 5a - 5a^2$

㉕ $2a$

27. Solve $2(x-3) + 5 = 7$

$2x - 6 + 5 = 7$

$2x - 1 = 7$

$+1 \quad = +1$

$\frac{2x}{2} = \frac{8}{2}$

㉗ $x = 4$

29. Solve $15 = 3(x-1) + 2(4-x)$

$15 = 3x - 3 + 8 - 2x$

$15 = x + 5$

$-5 \quad = \quad -5$

㉙ $10 = x$