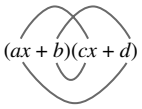
2 Bridging Unit: Polynomials and the binomial theorem

Topic A: Expanding brackets

Bridging to Ch2.1

You know how to find the product of two binomials by multiplying every combination of terms together and simplifying. Take extra care when squaring a binomial, and remember that $(x+a)^2=(x+a)(x+a)=\ x^2+2ax+a^2$ NOT x^2+a^2



Example 1

Expand and simplify $(3x-5)^2$

$(3x-5)^2=(3x-5)(3x-5)$ — Always write in this form until you are confident.

$=9x^2-15x-15x+25$

$=9x^2-30x+25$ — Simplify the *x*-terms.

Try It 1

Expand and simplify **a** $(x-7)^2$ **b** $(5x+1)^2$

To find the product of three binomials, first expand any pair, then multiply by the third.

Example 2

Expand and simplify $(x+3)(x-2)(x+1)$

$(x+3)(x-2) = x^2 - 2x + 3x - 6$ — Expand the first two pairs.

$= x^2 + x - 6$ — Simplify $-2x + 3x$ to x

$(x^2 + x - 6)(x+1) = x^3 + x^2 + x^2 + x - 6x - 6$ — 3 terms × 2 terms = 6 terms

$= x^3 + 2x^2 - 5x - 6$ — Add the x^2-terms and simplify $x - 6x$ to $-5x$

Try It 2

Expand and simplify **a** $(x-3)(x-1)(x+1)$ **b** $(x+2)^2(x-4)$

Bridging Exercise Topic A

Bridging to Ch2.1

1 Expand and simplify each of these expressions.

a $(x-4)^2$

b $(x+6)^2$

c $(x-9)^2$

d $(x+5)^2$

e $(2x+1)^2$

f $(3x-2)^2$

g $(4x+3)^2$

h $(5x+2)^2$

i $(3-x)^2$

j $(7-2x)^2$

k $(8-3x)^2$

l $(10-9x)^2$

2 Expand and simplify each of these expressions.

a $(x+5)(x+2)(x+4)$

b $(x+2)(x+7)(x-1)$

c $(x-3)(x+8)(2-x)$

d $(x+6)(2x-5)(x-8)$

e $(3x+1)(2x-1)(x+5)$

f $(2x-3)(3x-4)(5-4x)$

g $(x+5)^2(x+9)$

h $(3-x)^2(x-8)$

i $(x+7)(x-9)^2$

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

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

l $(2x-11)^2(3-2x)$