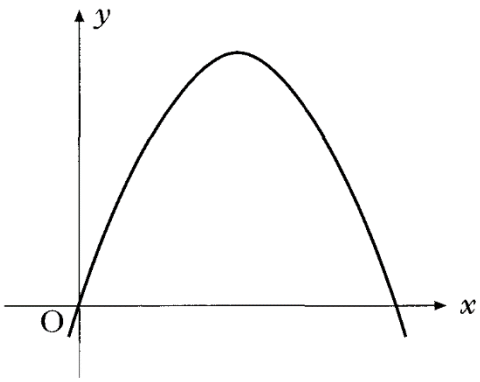
Nat 5/Credit/Int 2: Algebraic Expressions

Nat 5 2019 P1 Q3	3. Expand and simplify $(x+5)(2x^2-7x-3)$. 3	3
Ans	$2x^3+3x^2-38x-15$	
Nat 5 2018 P1 Q2	2. Expand and simplify $(3x+1)(x-1)+2(x^2-5)$. 3	3
Ans	$5x^2-2x-11$	
Nat 5 2017 P1 Q4	Expand and simplify $(2x+3)(x^2-4x+1)$.	3
Ans	$2x^3 - 5x^2 - 10x + 3$	
Nat 5 2016 P2 Q4	Factorise fully $3x^2 - 48$.	2
Ans	$3(x - 4)(x + 4)$	
Nat 5 2015 P1 Q4	Multiply out the brackets and collect like terms $(x-4)(x^2+x-2)$.	3
Ans	$x^3 - 3x^2 - 6x + 8$	
Int 2 2015 P1 Q1	Multiply out the brackets and collect like terms. $(2x + 6)(5x - 3) + 9x$	3

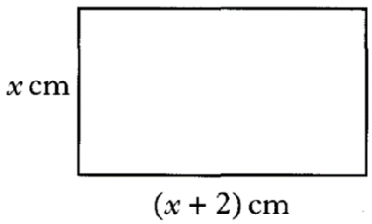
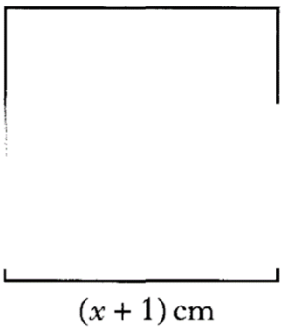
Ans	$10x^2 + 33x - 18$	
Nat 5 2014 P1 Q2	Multiply out the brackets and collect like terms: $(2x-5)(3x+1)$.	2
Ans	$6x^2 - 13x - 5$	
Int 2 2014 P1 Q2	Multiply out the brackets and collect like terms. $(3x + 2)(x - 5) + 8x$	3
Ans	$3x^2 - 5x - 10$	
Int 2 2014 P2 Q3	Factorise **fully** $3x^2 + 9x - 12$.	3
Ans	$3(x + 4)(x - 1)$	
Nat 5 Specimen P1 Q2	Multiply out the brackets and collect like terms $(2x+3)(x^2-4x+1)$.	3
Ans	$2x^3 - 5x^2 - 10x + 3$	
Int 2 2013 P1 Q1	Factorise $6ab - 7bc$.	1
Ans	$b(6a - 7c)$	

Int 2 2013 P2 Q1	Multiply out the brackets and collect like terms. $(x + 2)(x - 5) - 9x$	3
Ans	$x^2 - 12x - 10$	
Int 2 2012 P1 Q8	(*a*) Factorise $a^2 + 2ab + b^2$. (*b*) Hence, or otherwise, find the value of $94^2 + 2 \times 94 \times 6 + 6^2$.	3
Ans	(a) $(a + b)^2$ (b) 10 000	
Int 2 2012 P2 Q2	Multiply out the brackets and collect like terms. $(3x - 5)(x^2 + 2x - 6)$	3
Ans	$3x^3 + x^2 - 28x + 30$	
Int 2 2011 P1 Q2	Multiply out the brackets and collect like terms. $5x + (3x + 2)(2x - 7)$	3
Ans	$6x^2 - 12x - 14$	
Int 2 2010 P1 Q4(a)	Factorise $x^2 + x - 6$.	2
Ans	$(x + 3)(x - 2)$	
Int 2 2010 P1 Q4(b)	Multiply out the brackets and collect like terms. $(3x + 2)(x^2 + 5x - 1)$	3

Ans	$3x^3 + 17x^2 + 7x - 2$	
Int 2 2009 P1 Q3	Factorise $x^2 - 5x - 24.$	2
Ans	$(x - 8)(x + 3)$	
Int 2 2009 P1 Q4	Multiply out the brackets and collect like terms. $(x + 5)(2x^2 - 3x - 1)$	3
Ans	$2x^3 + 7x^2 - 16x - 5$	
Int 2 2008 P1 Q4	(a) Factorise $x^2 - y^2.$ (b) Hence, or otherwise, find the value ot $9 \cdot 3^2 - 0 \cdot 7^2.$	3
Ans	(a) $(x - y)(x + y)$ (b) 86	
Int 2 2008 P1 Q2	Multiply out the brackets and collect like terms. $(3x + 2)(x - 5) + 8x$	3
Ans	$3x^2 - 5x - 10$	
Credit 2008 P1 Q2	**2.** Factorise fully $5x^2 - 45.$	2
Ans	$5(x - 3)(x + 3)$	

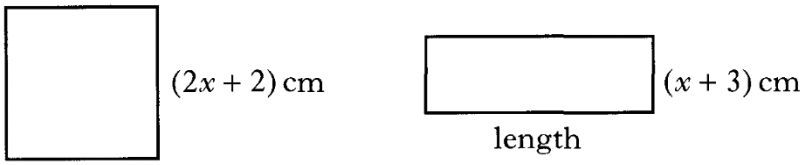
Int 2 2007 P1 Q7a	The graph shown below is part of the parabola with equation $y = 8x - x^2$.  (*a*) By factorising $8x - x^2$, find the roots of the equation $8x - x^2 = 0$.	2
Ans	x = 0, x = 8	
Int 2 2007 P2 Q7a	Factorise **fully** $2x^2 - 18$.	2
Ans	2(x – 3)(x + 3)	
Int 2 2007 P1 Q5	Multiply out the brackets and collect like terms. $(x + 3)(x^2 + 4x - 12)$	3
Ans	$x^3 + 7x^2 - 36$	
Credit 2007 P1 Q5	**5.** Remove brackets and simplify $(2x + 3)^2 - 3(x^2 - 6)$.	3
Ans	$x^2 + 12x + 27$	

Int 2 2006 P1 Q2	Multiply out the brackets and collect like terms. $(2y-3)(y^2+4y-1)$	3
Ans	$2y^3 + 5y^2 - 14y + 3$	
Int 2 2006 P2 Q6	Factorise $4p^2-49.$	2
Ans	$(2p-7)(2p+7)$	
Credit 2006 P1 Q5	**5.** (*a*) Factorise $4x^2-y^2.$ (*b*) Hence simplify $\frac{4x^2-y^2}{6x+3y}.$	3
Ans	(a) $(2x-y)(2x+y)$ (b) $\frac{2x-y}{3}$	
Credit 2006 P2 Q4	**4.** (*a*) Expand and simplify $(x+4)(3x-1).$	1
Ans	$3x^2 + 11x - 4$	
Int 2 2005 P1 Q3a	Multiply out the brackets and collect like terms. $(4x+2)(x-5)+3x$	3
Ans	$4x^2 - 15x - 10$	

Int 2 2005 P1 Q3b	Factorise $2p^2 - 5p - 12.$	2
Ans	(2p + 3)(p – 4)	
Int 2 2005 P1 Q8	A rectangle has length $(x + 2)$ centimetres and breadth x centimetres.  (*a*) Write down an expression for the area of the rectangle. A square has length $(x + 1)$ centimetres.  (*b*) The area of the square above is greater than the area of the rectangle. By how much is it greater?	3
Ans	(a) x(x+2) (b) $1cm^2$	
Int 2 2004 P2 Q3a	Multiply out the brackets and collect like terms. $5x + (x - 4)(3x + 1)$	3
Ans	$3x^2 – 6x - 4$	

Int 2 2004 P2 Q3b	Factorise $3x^2 - 7x + 2.$	2
Ans	(3x – 1)(x – 2)	
Int 2 2003 P1 Q1	Multiply out the brackets and collect like terms. $(2a - b)(3a + 2b)$	2
Ans	$6a^2 + ab - 2b^2$	
Int 2 2003 P1 Q8a	Factorise $7 + 6x - x^2$.	2
Ans	(7 – x)(1 + x)	
Credit 2003 P1 Q5	**5.** Factorise $2x^2 - 7x - 15.$	2
Ans	(2x + 3)(x – 5)	
Credit 2003 P1 Q3	**3.** Simplify $3(2x - 4) - 4(3x + 1).$	3
Ans	-6x - 16	
Int 2 2002W P2 Q10a	(*a*) Multiply out the brackets and collect like terms. $(2x + 3)(x^2 - 5x + 2)$	3
Ans	$2x^3 - 7x^2 - 11x + 6$	

Int 2 2002W P2 Q10b	Factorise $2x^2 - 7x - 9.$	2
Ans	(2x – 9)(x + 1)	
Int 2 2002 P1 Q4	Multiply out the brackets and collect like terms. $(x - 3)(x^2 + 4x - 1)$	3
Ans	$x^3 + x^2 - 13x + 3$	
Int 2 2002 P2 Q5a	(i) Factorise completely $3y^2 - 6y.$ (ii) Factorise $y^2 + y - 6.$	3
Ans	(i) 3y(y – 2) (ii) (y + 3)(y – 2)	
Credit 2002 P1 Q5	**5.** (*a*) Factorise $p^2 - 4q^2$. (*b*) Hence simplify $\frac{p^2 - 4q^2}{3p + 6q}$.	3
Ans	**5.** (*a*) $(p - 2q)(p + 2q)$ (*b*) $\frac{(p - 2q)(p + 2q)}{3(p + 2q)} = \frac{p - 2q}{3}$	
Int 2 2001 P1 Q1	Factorise $x^2 + 2x - 15.$	2

Ans	(x + 5)(x – 3)	
Int 2 2001 P1 Q7	The square and rectangle shown below have the same **perimeter**.  Show that the length of the rectangle is $(3x + 1)$ centimetres.	2
Ans	Proof	
Int 2 2001 P2 Q7	Multiply out the brackets and collect like terms. $(x + 4)(2x^2 + 3x - 1)$	3
Ans	$2x^3 + 11x^2 + 11x - 4$	
Credit 2001 P1 Q6	**6.** A is the point (a^2, a). T is the point (t^2, t), $a \neq t$ Find the gradient of the line AT. Give your answer in its simplest form.	3
Ans	$\frac{1}{t+a}$	