Topic: Solving Quadratics by Factorising

Topic/Skill	Definition/Tips	Example
1. Quadratic	A quadratic expression is of the form	Examples of quadratic expressions:
_		x^2
	$ax^2 + bx + c$	$8x^2 - 3x + 7$
	where a, b and c are numbers, $a \neq 0$	Examples of non-quadratic expressions:
		$2x^3 - 5x^2$
		9x-1
2. Factorising	When a quadratic expression is in the form	$x^{2} + 7x + 10 = (x + 5)(x + 2)$
Quadratics	$x^2 + bx + c$ find the two numbers that add	(because 5 and 2 add to give 7 and
	to give b and multiply to give c.	multiply to give 10)
		$x^{2} + 2x - 8 = (x + 4)(x - 2)$
		(because +4 and -2 add to give +2 and
		multiply to give -8)
3. Difference	An expression of the form $a^2 - b^2$ can be	$\frac{x^2 - 25}{x^2 - 25} = (x + 5)(x - 5)$
of Two	factorised to give $(a + b)(a - b)$	$16x^2 - 81 = (4x + 9)(4x - 9)$
Squares		
4. Solving	Isolate the x^2 term and square root both	$2x^2 = 98$
Quadratics	sides.	$x^2 = 49$
$(ax^2 = b)$	Remember there will be a positive and a	$x = \pm 7$
	negative solution.	2 2 2
5. Solving	Factorise and then $solve = 0$.	$x^2 - 3x = 0$
Quadratics $(ax^2 + bx =$		x(x-3) = 0 x = 0 or x = 3
(ux + bx = 0)		x = 0 or x = 3
6. Solving	Factorise the quadratic in the usual way.	Solve $x^2 + 3x - 10 = 0$
Quadratics by	Solve = 0	
Factorising		Factorise: $(x + 5)(x - 2) = 0$
(a = 1)	Make sure the equation $= 0$ before	x = -5 or x = 2
	factorising.	
7. Factorising	When a quadratic is in the form	Factorise $6x^2 + 5x - 4$
Quadratics	$ax^2 + bx + c$	
when $a \neq 1$	1. Multiply a by $c = ac$	$1.6 \times -4 = -24$
	2. Find two numbers that add to give b and	2. Two numbers that add to give +5 and
	multiply to give ac.	multiply to give -24 are +8 and -3 3. $6x^2 + 8x - 3x - 4$
	3. Re-write the quadratic, replacing <i>bx</i> with the two numbers you found.	4. Factorise in pairs:
	4. Factorise in pairs – you should get the	2x(3x + 4) - 1(3x + 4)
	same bracket twice	5. Answer = $(3x + 4)(2x - 1)$
	5. Write your two brackets – one will be the	
	repeated bracket, the other will be made of	
	the factors outside each of the two brackets.	
8. Solving	Factorise the quadratic in the usual way.	Solve $2x^2 + 7x - 4 = 0$
Quadratics by	Solve = 0	
Factorising		Factorise: $(2x - 1)(x + 4) = 0$
$(a \neq 1)$	Make sure the equation $= 0$ before	Factorise: $(2x - 1)(x + 4) = 0$ $x = \frac{1}{2} \text{ or } x = -4$
	factorising.	1 $x = \frac{1}{2}$ $x = -\frac{1}{4}$