## 1) Factorising and Manipulation of Formulae:

Factorising: 1. Taking out the HCF (taking out what's common)		<ul> <li>3. Quadratic (always has 3 terms x<sup>2</sup>, x, a)</li> <li>e.g.s</li> </ul>	
ii) $3x^2 - 18x$	= (x + 3)(x + 2)	= (x-6)(x+3)	
= 3x(x-6)			
	4. Difference of 2 Squares (a	lways 2 terms with a '-' between)	
	Note: Watch for square numbe	rs: 1, 4, 9, 16, 25, 36, 49, 64, 81	
	e.g.s		
ii) $3p - 3q - pk + kq$	i) $x^2 - 9y^2$	ii) $16a^2 - 25b^2$	
= 3(p-q) - k(p-q)	$= (x)^2 - (3y)^2$	$= (4a)^2 - (5b)^2$	
= (p-q)(3-k)	= (x - 3y)(x + 3y)	= (4a - 5b)(4a + 5b)	
	what's common) ii) $3x^2 - 18x$ = 3x(x - 6) ii) $3p - 3q - pk + kq$ = 3(p - q) - k(p - q) = (p - q)(3 - k)	what's common)3. Quadratic (always has 3 term e.g.s i) $x^2 + 5x + 6$ $= (x + 3)(x + 2)$ ii) $3x^2 - 18x$ $= 3x(x - 6)$ iii) $x^2 + 5x + 6$ $= (x + 3)(x + 2)$ 4. Difference of 2 Squares (a Note: Watch for square number e.g.s i) $x^2 - 9y^2$ $= (x)^2 - (3y)^2$ $= (x - 3y)(x + 3y)$	

## 2) Solving Quadratic Equations:

a) Sol	ving Quadratic Eqns by factorising: (Equations with an	b) Solving Quadratic Eqns using the "-b Formula":	
<u>x²)</u>		Note: This method can be used for ALL quadratic equations.	
<u>Steps</u>	<u>1</u>	If $ax^2 + bx + c = 0$ is a quadratic equation, then the roots of the	
1.	Bring all terms to the left-hand side (LHS) and leave '0'	equation are given by:	
	on the RHS		
2.	Factorise the LHS (See section on Factorising in previous	$-b + \sqrt{b^2 - 4ac}$ See Tables	
	tab)	$\sum_{x=\frac{1}{2a}} x = \frac{1}{2a}$ pg 20	
3.	If LHS can't be factorised the 'Quadratic Formula'	20 13	
	needs to be used (See Example 3 on the right)		
4.	Let each factor be = 0		
5.	Solve the two simple equations to find the two answers.	<b>Example 3:</b> Solve $x^2 - 2x - 5 = 0$ .	
		In this case: a = 1, b = -2 and c = -5	
<u>Exam</u>	<b>ble 1:</b> $x^2 - 3x - 18 = 0$		
	(x-6)(x+3) = 0	$x = \frac{-b \pm \sqrt{b^2 - 4ac}}{4ac}$	
	x - 6 = 0 or $x + 3 = 0$	2a	
	x = 6 or $x = -3$	$x = \frac{-(-2) \pm \sqrt{(-2)^2 - 4(1)(-5)}}{2(4)}$	
		2(1)	
Exam	<b>ble 2:</b> $4x^2 - 25 = 0$	$\Rightarrow x = \frac{2 \pm \sqrt{24}}{2}$	
	(2x-5)(2x+5) = 0	2	
	2x - 5 = 0 or $2x + 5 = 0$	$\Rightarrow x = 3.45 \qquad or  x = -1.45$	
	$\Rightarrow 2x = 5$ or $2x = -5$		
	$x = \frac{5}{2}$ or $x = \frac{-5}{2}$		
	2 2		
	and the second		
	ndratic Fans with tractions:	d) Forming Quadratic Equation from the roots:	
<u>c) Qu</u> Exam	advance Eqns with fractions: $a_{1} = \frac{2}{3} - \frac{3}{3} = \frac{5}{3}$	d) Forming Quadratic Equation from the roots: Method 1:	
<u>Exam</u>	adratic Eqns with fractions: <u>ole:</u> Solve $\frac{2}{x+1} - \frac{3}{x-2} = \frac{5}{2}$	<u>d) Forming Quadratic Equation from the roots:</u> <u>Method 1:</u> Steps:	
<u>Exam</u> Metho	<b>advatic Eqns with fractions:</b> <b>ble:</b> Solve $\frac{2}{x+1} - \frac{3}{x-2} = \frac{5}{2}$ <b>bd 1:</b> (Multiply across by common denominator)	<u>d) Forming Quadratic Equation from the roots:</u> <u>Method 1:</u> <u>Steps:</u> 1 Let x = both of the roots	
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