

1	a	E.g. $x^2 + 4x - 2x - 8 (= x^2 + 2x - 8)$ or $x^2 - 2x + x - 2 (= x^2 - x - 2)$ or $x^2 + 4x + x + 4 (= x^2 + 5x + 4)$		3	M1 for multiplying out two brackets correctly with no more than one error
		E.g. $x^3 + 2x^2 - 8x + x^2 + 2x - 8$ or $x^3 + 4x^2 - 2x^2 - 8x + x^2 + 4x - 2x - 8$ or $x^3 - x^2 - 2x + 4x^2 - 4x - 8$ or $x^3 - 2x^2 + x^2 - 2x + 4x^2 - 8x + 4x - 8$ or $x^3 + 5x^2 + 4x - 2x^2 - 10x - 8$ or $x^3 + 4x^2 + x^2 + 4x - 2x^2 - 8x - 2x - 8$			M1 for at least 3 terms correct out of a maximum of 6 terms or for at least 4 terms correct out of a maximum of 8 terms
			$x^3 + 3x^2 - 6x - 8$		A1

2	(a)	$(3x-1)(x+2) = 3x^2 + 6x - x - 2 (= 3x^2 + 5x - 2)$ or $(3x-1)(3x+1) = 9x^2 + 3x - 3x - 1 (= 9x^2 - 1)$ or $(x+2)(3x+1) = 3x^2 + x + 6x + 2 (= 3x^2 + 7x + 2)$		3	M1 for a correct intention to multiply all 3 factors by multiplying 2 factors only, allow one error
		$[(3x^2 + 5x - 2)(3x + 1) =] 9x^3 + 15x^2 - 6x + 3x^2 + 5x - 2$ or $[(9x^2 - 1)(x + 2) =] 9x^3 + 18x^2 - x - 2$ or $[(3x^2 + 7x + 2)(3x - 1) =] 9x^3 + 21x^2 + 6x - 3x^2 - 7x - 2$			M1 (dep)ft for expanding by the third factor, allow one error
			$9x^3 + 18x^2 - x - 2$		A1
		ALTERNATIVE			
		$9x^3 + 3x^2 + 18x^2 + 6x - 3x^2 - x - 6x - 2$		3	M2 for a complete expansion with 8 terms present, at least 4 of which must be correct
			$9x^3 + 18x^2 - x - 2$		A1

3	(a)	$(5-x)(2x+3) = 10x + 15 - 2x^2 - 3x (= -2x^2 + 7x + 15)$ or $(5-x)(x+4) = 5x + 20 - x^2 - 4x (= -x^2 + x + 20)$ or $(2x+3)(x+4) = 2x^2 + 8x + 3x + 12 (= 2x^2 + 11x + 12)$ $(-2x^2 + 7x + 15)(x+4) = -2x^3 - 8x^2 + 7x^2 + 28x + 15x + 60$ or $(-x^2 + x + 20)(2x+3) = -2x^3 - 3x^2 + 2x^2 + 3x + 40x + 60$ or $(2x^2 + 11x + 12)(5-x) = 10x^2 - 2x^3 + 55x - 11x^2 + 60 - 12x$		3	M1 multiplying 2 factors only but do not award if they multiply eg $(5-x)(2x+3)$ and $(5-x)(x+4)$ as their method allow one error
					M1 (dep)ft for expanding by the third factor, allow one further error
			$-2x^3 - x^2 + 43x + 60$		A1 Dep on M1
		ALTERNATIVE			
		$10x^2 + 15x + 40x + 60 - 2x^3 - 3x^2 - 8x^2 - 12x$		3	M2 for a complete expansion with 8 terms present, at least 4 of which must be correct (M1 for 4 correct terms from any number of terms)
			$-2x^3 - x^2 + 43x + 60$		A1

4	(a)	$n(3n^2 + 5n - 12n - 20)$ or $n(3n^2 - 7n - 20)$ or $(3n^2 + 5n)(n - 4)$ or $(n^2 - 4n)(3n + 5)$ or $3n^3 + 5n^2 - 12n^2 - 20n$		2	M1 for a correct partial expansion (may be unsimplified) (allow one error in the expansion of $(n - 4)(3n + 5)$ e.g. for any 3 correct terms or for 4 out of 4 correct terms ignoring signs or for $3n^2 - 7n \dots$ or for $\dots - 7n - 20$) A1 oe e.g. if correct answer seen allow further factorisation to $n(3n^2 - 7n - 20)$
			$3n^3 - 7n^2 - 20n$		

5	(a)	$5x(x + 2) = 5x^2 + 10x$ or $(x + 2)(3x - 4) = 3x^2 - 4x + 6x - 8 (= 3x^2 + 2x - 8)$ or $5x(3x - 4) = 15x^2 - 20x$		3	M1 for a correct intention to multiply all 3 factors by starting to multiply 2 factors only, allow one error
		eg $[(5x^2 + 10x)(3x - 4) =] 15x^3 - 20x^2 + 30x^2 - 40x$ or $[5x(3x^2 + 2x - 8) =] 15x^3 + 10x^2 - 40x$ or $[(x + 2)(15x^2 - 20x) =] 15x^3 - 20x^2 + 30x^2 - 40x$			M1 (dep)ft for expanding by the third factor, allow one error (some may do the expansion in one stage and will get to $15x^3 - 20x^2 + 30x^2 - 40x$ without firstly expanding two factors, allow two errors)
			$15x^3 + 10x^2 - 40x$		A1 isw correct factorisation eg $5(3x^3 + 2x^2 - 8x)$ do not isw incorrect factorisation eg $15x^3 + 10x^2 - 40x = 3x^3 + 2x^2 - 8x$

6	(c)	$5x(3x + 4) = 15x^2 + 20x$ or $5x(2x - 1) = 10x^2 - 5x$ or $(3x + 4)(2x - 1) = 6x^2 - 3x + 8x - 4$ ($= 6x^2 + 5x - 4$)		3	M1 for a correct intention to multiply all 3 factors by multiplying 2 factors only, allow one error
		$(15x^2 + 20x)(2x - 1) = 30x^3 - 15x^2 + 40x^2 - 20x$ oe $(10x^2 - 5x)(3x + 4) = 30x^3 + 40x^2 - 15x^2 - 20x$ oe $5x(6x^2 + 5x - 4) = 30x^3 + 25x^2 - 20x$ oe			M1 (dep)ft for expanding by the third factor, allow one error (some may do the expansion in one stage and will get to $30x^3 - 15x^2 + 40x^2 - 20x$ without firstly expanding two factors – this gains M2, allow one error)
		<i>Correct answer scores full marks (unless from obvious incorrect working)</i>	$30x^3 + 25x^2 - 20x$		A1 isw correct factorisation ($30x^3 + 25x^2 - 20x$ must be seen previously to award 3 marks) eg $5(6x^3 + 5x^2 - 4x)$ $x(30x^2 + 25x - 20)$ $5x(6x^2 + 5x - 4)$ do not isw incorrect simplification eg $30x^3 + 25x^2 - 20x = 6x^3 + 5x^2 - 4x$ gets M2A0

7	$3x(2x-5) = 6x^2 - 15x$ or		3	M1 for multiplying $3x$ by $(2x-5)$ with both terms correct or
	$(2x-5)^2 = 4x^2 - 10x - 10x + 25$ or			for multiplying $(2x-5)$ by $(2x-5)$ with 3 out of 4 terms correct or
	$(2x-5)^2 = 4x^2 - 20x + 25$			for multiplying $(2x-5)$ by $(2x-5)$ and getting $4x^2 - 20x \dots$ or $\dots - 20x + 25$ (not for $4x^2 + 25$)
	$(6x^2 - 15x)(2x-5) = 12x^3 - 30x^2 - 30x^2 + 75x$ oe or			M1ft (dep) for multiplying the product of $3x$ and $(2x-5)$ by $(2x-5)$ with 3 out of 4 terms correct or
	$(6x^2 - 15x)(2x-5) = 12x^3 - 60x^2 + 75x$ oe or			for multiplying the product of $3x$ and $(2x-5)$ by $(2x-5)$ and getting $12x^3 - 60x^2 \dots$ or $\dots - 60x^2 + 75x$
	$3x(4x^2 - 10x - 10x + 25) = 12x^3 - 30x^2 - 30x^2 + 75x$ oe or			for multiplying the product of $(2x-5)$ and $(2x-5)$ by $3x$ with 3 out of 4 terms correct or
	$3x(4x^2 - 20x + 25) = 12x^3 - 60x^2 + 75x$			for multiplying the product of $(2x-5)$ and $(2x-5)$ by $3x$ with 2 out of 3 terms correct or
				Expansion in one stage will lead to $12x^3 - 30x^2 - 30x^2 + 75x$ without firstly expanding two factors – award M2 for 3 out of 4 terms correct M1 for 2 out of 4 terms correct
	<i>Working required</i>	$12x^3 - 60x^2 + 75x$		A1 dep on M1
				Total 3 marks

8	(a)	eg $3x^2 - 2x + 18x - 12$ ($= 3x^2 + 16x - 12$) or $x^2 + 6x + 6x + 36$ ($= x^2 + 12x + 36$) (allow in a table with no sign indicating +)		3	M1 for a correct method to expand two brackets with at least 3 terms correct out of 4 terms seen (or 2 terms correct out of 3 terms seen)
		eg $3x^3 + 36x^2 + 108x - 2x^2 - 24x - 72$ or $3x^3 + 18x^2 + 18x^2 + 108x - 2x^2 - 12x - 12x - 72$ or $3x^3 + 16x^2 - 12x + 18x^2 + 96x - 72$ or $3x^3 - 2x^2 + 18x^2 - 12x + 18x^2 - 12x + 108x - 72$			M1ft ft dep on M1 and a quadratic for a correct method to multiply by the 3 rd bracket allow one further error
		<i>Correct answer scores full marks (unless from obvious incorrect working)</i>	$3x^3 + 34x^2 + 84x - 72$		A1 If no working shown then award B2 for 3 out of a maximum of 4 terms correct
		ALTERNATIVE			
		$3x^3 - 2x^2 + 18x^2 - 12x + 18x^2 - 12x + 108x - 72$		3	M2 For a complete expansion with 8 terms present of which 4 are correct (M1 for 4 correct terms from any number of terms)
			$3x^3 + 34x^2 + 84x - 72$		A1