1		$yn^2 = n^2 + d$ **or** $y = 1 + \dfrac{d}{n^2}$			4	M1	
		$yn^2 - n^2 = d$ **or** $-d = n^2 - yn^2$ **or** $y - 1 = \dfrac{d}{n^2}$				M1	
		$n^2(y - 1) = d$ **or** $-d = (1 - y)n^2$				M1	for factorising n^2 from a suitable expression. or $n^2 = \dfrac{d}{y-1}$
			$n = \sqrt{\dfrac{d}{y-1}}$			A1	Accept $n = \sqrt{\dfrac{-d}{1-y}}$ Penalise $\pm\sqrt{}$
							Total 4 marks

2		$xy + 3y = 5 - 2x$ oe				M1	multiplying both sides by $(x + 3)$ and expanding the brackets correctly
		e.g. $xy + 2x = 5 - 3y$				M1	ft dep on 2 terms on left and $(5 - 2x)$ on right, for collecting all x terms on one side and non-x terms on the other side
		eg $x(y + 2) = 5 - 3y$				M1	ft, dep on 2 terms in x, for factorising for x
			$x = \dfrac{5-3y}{2+y}$		4	A1	oe allow $\dfrac{5-3y}{2+y}$ as answer so long as previously seen $x = \dfrac{5-3y}{2+y}$
							Total 4 marks

3	a	e.g. $d - g = 2ac$ $\dfrac{d}{2c} = \dfrac{g}{2c} + a$				M1	for a correct first step e.g. subtract g from both sides **OR** divide all terms by 2 **OR** divide all terms by c **OR** divide all terms by $2c$
			$a = \dfrac{d-g}{2c}$		2	A1	oe

4		$y^2 = \dfrac{x+1}{x-4}$			4	M1	for squaring
		$y^2(x - 4) = x + 1$ or $y^2 x - 4y^2 = x + 1$				M1	for removing the fraction
		$y^2 x - x = 4y^2 + 1$ or $-4y^2 - 1 = x - y^2 x$ **or** $x(y^2 - 1) = 4y^2 + 1$ or $-4y^2 - 1 = x(1 - y^2)$				M1	for expanding the bracket **and** rearranging for x so that the terms in x are on one side of the correct equation
			$x = \dfrac{4y^2 + 1}{y^2 - 1}$			A1	for $x = \dfrac{4y^2+1}{y^2-1}$ or $x = \dfrac{-4y^2-1}{1-y^2}$ (need to see $x =$ somewhere)
							Total 4 marks

5	(b)	eg $p + d = at$ **or** $-at = -d - p$ **or** $\dfrac{p}{a} = \dfrac{at}{a} - \dfrac{d}{a}$ oe			2	M1	Correct first stage in rearrangement
		Working not required, so correct answer scores full marks	$t = \dfrac{p+d}{a}$			A1	oe eg $t = \dfrac{p}{a} + \dfrac{d}{a}$ **or** $t = \dfrac{-d-p}{-a}$ Must have "$t =$" either in working or on answer line

6	a	e.g. $A + 5z = \dfrac{c}{y}$ oe **or** $Ay = c - 5yz$ oe			2	M1	for a correct first step e.g. add $5z$ to both sides **or** multiply all terms by y
			$c = y(A + 5z)$			A1	oe

7	(b)	$p^2 = \dfrac{ac+8}{3+c}$			4	M1	for removing square root
		$3p^2 + cp^2 = ac + 8$				M1	for multiplying by denominator and expanding in a correct equation
		$cp^2 - ac = 8 - 3p^2$ **or** $3p^2 - 8 = ac - cp^2$				M1ft	for gathering terms in c on one side and other terms the other side ft their equation dep on 2 terms in c and two other terms
			$c = \dfrac{8-3p^2}{p^2-a}$			A1	or $c = \dfrac{3p^2-8}{a-p^2}$

8 (b)	$g + 7 = \dfrac{c+3}{4+c}$ or $g(4+c) = c+3-7(4+c)$ or $g = \dfrac{c+3}{4+c} - \dfrac{7(4+c)}{4+c}\left(= \dfrac{c+3-28-7c}{4+c}\right)$			4	M1	Adding 7 to both sides as a first step or removing fraction correctly
	eg $4g + gc + 28 + 7c = c + 3$ or $4g + gc = c + 3 - 28 - 7c$ oe				M1	removing fraction and expanding all brackets in an equation with no more than one error
	eg $gc + 7c - c = 3 - 28 - 4g$ or $28 - 3 + 4g = c - 7c - gc$				M1ft	ft dep on previous M1 - terms in c on one side and other terms on the other side in an equation
		$c = \dfrac{-(4g+25)}{g+6}$			A1	oe eg $c = \dfrac{25+4g}{-6-g}$ or $c = \dfrac{3-28-4g}{g+7-1}$ oe [if c = is missing allow full marks if seen in working otherwise 3 marks] (SCB2 for an answer of $c = \dfrac{-4-4g}{g-1}$ oe or $c = \dfrac{31-4g}{g-8}$ oe SCB1 in working for $4g + cg = c + 3 - 7$ oe or $4g + cg - 28 - 7c = c + 3$ oe

9	$(a =) \dfrac{14}{3 \times \dfrac{7}{4y-3} - 7}$			3	M1	For a correct substitution
	$(a =) \dfrac{14(4y-3)}{21-7(4y-3)}$ oe eg $\dfrac{56y-42}{21-28y+21}$				M1	or for a correct but unsimplified answer in the form $\dfrac{m}{n}$ ie the denominator should be simplified to remove the fraction
		$\dfrac{4y-3}{3-2y}$			A1	oe but must be simplified
						Total 3 marks

9 alt	$x = \dfrac{14+7a}{3a}$ **and** $\dfrac{14+7a}{3a} = \dfrac{7}{4y-3}$			3	M1	For rearranging 'x' to be in terms of a and equating two expressions for a
	$a(42-28y) = 56y - 42$ oe eg $(a =) \dfrac{56y-42}{21-28y+21}$				M1	or for a correct but unsimplified answer in the form $\dfrac{m}{n}$
		$\dfrac{4y-3}{3-2y}$			A1	oe but must be simplified
						Total 3 marks

10	$n^2 t^3 = 4d + t^3$	$n^2 = \dfrac{4d}{t^3} + 1$		4	M1 for multiplying by the denominator or for dividing the RHS by t^3
	$t^3(n^2 - 1) = 4d$ oe	$n^2 - 1 = \dfrac{4d}{t^3}$			M1 for isolating terms in t^3 **and** factorising the correct expression of the equation or for isolating the $\dfrac{4d}{t^3}$ term
	$t^3 = \dfrac{4d}{(n^2-1)}$ oe	$t^3 = \dfrac{4d}{(n^2-1)}$			M1 for making t^3 the subject
			$t = \sqrt[3]{\dfrac{4d}{(n^2-1)}}$		A1 oe eg. $t = \sqrt[3]{\dfrac{-4d}{(1-n^2)}}$ or $t = \left(\dfrac{4d}{(n^2-1)}\right)^{\frac{1}{3}}$ SC B2 for $t = \sqrt[3]{\dfrac{4d}{(n^2+1)}}$
					Total 4 marks

11	(d)	$c + 8v = t^3$			2	M1
			$t = \sqrt[3]{c+8v}$			A1 oe
						SCB1 for an answer of $t = \dfrac{c+8v}{3}$ oe

12		$y^3 = \dfrac{6+5x}{x+4}$		4	M1 for removing cube root
		$xy^3 + 4y^3 = 6 + 5x$ oe **or** $x - \dfrac{5x}{y^3} = \dfrac{6}{y^3} - 4$			M1 for multiplying by denominator and expanding in a **correct** equation **or** for gathering x terms on one side and the other terms on the other side in a **correct** equation in fractional form
		$xy^3 - 5x = 6 - 4y^3$			M1 for gathering terms in x on one side and other terms the other side in a **correct** equation **or** for removing all fractions
		Correct answer scores full marks (unless from obvious incorrect working)	$x = \dfrac{6-4y^3}{y^3-5}$		A1 or $x = \dfrac{4y^3-6}{5-y^3}$ SCB2 for $x = \dfrac{6-4y^{\frac{1}{3}}}{y^{\frac{1}{3}}-5}$ or $x = \dfrac{4y^{\frac{1}{3}}-6}{5-y^{\frac{1}{3}}}$ $y^{\frac{1}{3}}$ can also be y^2
					Total 4 marks

13	(b)	$w^2 = \dfrac{e+g}{ef-d}$		4	M1	for removing square root
		$w^2 ef - w^2 d = e + g$ oe			M1	for multiplying by denominator and expanding in a correct equation
		$w^2 ef - e = g + w^2 d$ oe			M1ft	ft their equation dep on 2 terms in e and two other terms for gathering terms in e on one side and other terms the other side
		Correct answer scores full marks (unless from obvious incorrect working)	$e = \dfrac{g+w^2 d}{w^2 f - 1}$		A1	oe eg $e = \dfrac{-g-w^2 d}{1-w^2 f}$, $e = -\dfrac{g+w^2 d}{1-w^2 f}$ oe must see $e =$ on answer line or in working.