1	(b)	$2x = -19 - 5$ **or** $2x = -24$ **or** $x = \frac{-19-5}{2}$ or $x = \frac{-24}{2}$		2	M1	
			−12		A1	cao

2	(b)		7	1	B1	
	(c)		4	1	B1	

3	(a)	$20 - 5x$ $(= 7 - 3x)$		3	M1	for expansion of bracket
		E.g. $20 - 7 = -3x + 5x$ or $-5x + 3x = 7 - 20$			M1	ft from a 4-term equation for a correct process of isolating terms in x on one side of the equation and numbers on the other side
			6.5 oe		A1	dep on M2 awarded

4	b	eg $(x =)$ $(27 - 5) \div 4$			M1	complete method
			5.5	2	A1	oe

5	(b)	$4x^2 + 10x + 10x + 25 = 4x^2 - 2x + 6x - 3$ $4x^2 + 20x + 25 = 4x^2 + 4x - 3$		3	M1	Correct expansion of $(2x + 5)^2$ **or** $(2x + 3)(2x - 1)$ **or** expansion of **both** sets of brackets with at least 3 of 4 terms correct in both (NB: if written as a 3 term quadratic (and not seen as 4 terms) then the middle term must be correct as it is equivalent to 2 correct terms) (eg (RHS) $4x^2 + 4x + 3$ has 1 error, $2x^2 + 4x - 3$ has 1 error, $4x^2 + 10x - 3$ has 2 errors)
		$10x + 10x - 6x + 2x = -3 - 25$ **or** $3 + 25 = -16x$ **or** $16x = -28$ oe			M1	ft if previous mark awarded. For terms in x on one side and number terms on the other side in a correct ft equation dependent on a linear equation
		Working not required, so correct answer scores full marks (unless from obvious incorrect working eg -1.75 oe from $2x^2 + 20x + 25 = 2x^2 + 4x - 3$ scores M2A0)	−1.75		A1	**or** $-1\frac{3}{4}$ **or** $-\frac{7}{4}$ **or** $-\frac{28}{16}$ **or** $-1\frac{12}{16}$ oe

6	c	E.g. $5x - x = 6 + 11$ **or** $4x - 11 = 6$ **or** $5x = x + 17$			M1	for correct rearrangement with x terms on one side and numbers on the other **or** the correct simplification of either x terms or numbers on one side in a correct equation
		$4x = 17$ **or** $-4x = -17$			M1	
			4.25	3	A1	oe, dep on at least M1

7	$2x - 3 = 20 \div 5$ or $10x - 15 = 20$		3	M1	
	$2x =$ "4" $+ 3$ oe or $10x = 20 +$ "15" $10x = 35$ oe			M1	For collecting terms, ft their expansion
		3.5 oe		A1	dep M1 accept $\frac{7}{2}$ or $\frac{35}{10}$
					Total 3 marks

8	(b)	$2n = 16 - 5$ or $2n = 11$ oe **or** $(16 - 5) \div 2$		2	M1	for a correct first step **or** a correct calculation for n
			5.5		A1	for 5.5 or $\frac{11}{2}$ or $5\frac{1}{2}$

9	(b)	$4 \times (4 - 3x) = 5 - 8x$ oe **or** $16 - 12x = 5 - 8x$ oe **or** $4 - 3x = \frac{5}{4} - 2x$ oe		3	M1	for removal of fraction in a correct equation
		e.g. $16 - 5 = 12x - 8x$ **or** $11 = 4x$ oe **or** $4 - \frac{5}{4} = 3x - 2x$			M1	for terms in x on one side **and** numbers on the other side in an equation, allow correct rearrangement of their equation in the form $ax + b = cx + d$
			2.75		A1	(dep on M1) oe e.g. $2\frac{3}{4}$ or $\frac{11}{4}$

10	(e)		26	1	B1	
	(f)	$424 = 4n$		2	M1	For 424 or 324 + 225 –125 with at most one error

11	(a)	eg $10p = 3p - 5$ **or** $p = \frac{3p}{10} - \frac{5}{10}$ oe eg $p = 0.3p - 0.5$		3	M1	for a correct first step – multiplying both sides by 10 correctly or writing the RHS as 2 terms each over 10 or each term as a decimal [must be in a correct equation]
		eg $10p - 3p = -5$ **or** $7p = -5$ **or** $p - \frac{3p}{10} = -\frac{5}{10}$ **or** $0.7p = -0.5$			M1ft	(ft a 3 term equation) for collecting terms in p on one side and number the other
			$-\frac{5}{7}$		A1	(dep on at least M1) for $-\frac{5}{7}$ oe, accept –0.71(4...) allow –0.7 if you have seen $-\frac{5}{7}$ or $-5 \div 7$

12	(c)		27	1	B1 cao

13	(c)	$4p = 24 - 9$ or $4p = 15$ or $p + \frac{9}{4} = \frac{24}{4}$ oe or $(24 - 9) \div 4$ or $15 \div 4$		2	M1 for a correct first step **or** for a calculation for p
			$\frac{15}{4}$		A1 oe e.g. 3.75 or $3\frac{3}{4}$

14	x: −1, 0, 1, 2, 3, 4, 5 y: 5, 3, 1, −1, −3, −5, −7 (−1, 5) (0, 3) (1, 1) (2, −1) (3, −3) (4, −5) (5, −7)	Correct line between $x = -1$ and $x = 5$	3	B3 for a correct line between $x = -1$ and $x = 5$ (B2 for a correct straight line segment through at least 3 of (−1, 5) (0, 3) (1, 1) (2, −1) (3, −3) (4, −5) (5, −7) **or** for all of (−1, 5) (0, 3) (1, 1) (2, −1) (3, −3) (4, −5) (5, −7) plotted but not joined) (B1 for at least 2 correct points stated (may be in a table) **or** plotted **or** for a line drawn with a negative gradient through (0, 3) **or** for a line with a gradient of −2)
				Total 3 marks

15	(b)	$8x - 12$ **or** $\frac{3}{4}x - \frac{5}{4}$ oe or $0.75x - 1.25$ oe		3	M1 for correct multiplication by 4 **or** separate fractions on the RHS
		$8x - 3x = -5 + 12$ oe or $5x = 7$ oe **or** $2x - \frac{3}{4}x = -\frac{5}{4} + 3$ or $2x - 0.75x = -1.25 - 3$ oe			M1 ft (dep on 4 terms) for terms in x on one side of equation and number terms on the other
			$\frac{7}{5}$		A1 oe dep on M1 1.4 or $1\frac{2}{5}$ oe

16	200 (m*l*) written as 0.2 (*l*)or 3.5 (*l*) written as 3500 (m*l*)		4	B1	for a correct conversion
	3 × "0.2" (= 0.6) oe eg 0.2 + 0.2 + 0.2 or 3 × 200 (= 600) oe eg –200–200–200 or 3500 – 600 (= 2900)			M1	A correct calculation for the total amount of water in the 3 cups or the 4 jugs
	$\frac{3.5 - "0.6"}{4}$ or $\frac{"3500" - "600"}{4}$ oe			M1	For a fully correct method or for an answer of 0.725 (this alone gains B1M2)
		725		A1	(SCB1M1 (no other marks) for (3.5 – 0.2) ÷ 4 (= 0.825) or (3500 – 200) ÷ 4 (= 825))
					Total 4 marks

17	7×2.7 (=18.9) or 4×3.3 (= 13.2) or $\frac{3W+4\times3.3}{7} = 2.7$ oe eg $3W + 13.2 = 18.9$		3	M1	For one correct product or for a correct equation for W
	$\frac{7\times2.7-4\times3.3}{3}$ or $\frac{18.9-13.2}{3}$ or $\frac{5.7}{3}$ or $3W = 5.7$			M1	
	If you see 1.9 from correct working and they do further work to this value, award M2	1.9		A1	
					Total 3 marks

18	(c)	$5r = 8 + 3$ or $5r = 11$ or $-3 - 8 = -5r$ or $-11 = -5r$ or $r - \frac{3}{5} = \frac{8}{5}$ or $(8 + 3) \div 5$		2	M1 for a correct first step or for a calculation for r
			2.2		A1 oe

19	(a)		3	1	B1

20	(b)	$12x - 10$ **or** $2(6x - 5) = 4x - 7$ **or** $6x - 5 = \frac{4}{2}x - \frac{7}{2}$ oe		3	M1 for removal of fraction **and** multiplying out LHS **or** rearranging to remove the fraction **or** separating fraction (RHS) in an equation
		$12x - 4x = -7 + 10$ oe **or** $6x - \frac{4}{2}x = -\frac{7}{2} + 5$ oe			M1 ft (dep on 4 terms) for terms in x on one side of equation and number terms on the other
			$\frac{3}{8}$		A1 (dep M1) oe

21	(a)		6	1	B1
	(b)		19	1	B1

22	(c)		6	1	B1
	(d)		−1	1	B1

23	(d)	eg $7g - 2g + 3 = -5$ **or** $5g + 3 = -5$ **or** $7g = 2g - 5 - 3$ **or** $7g = 2g - 8$		3	M1 for correctly collecting the terms in g on one side or the numbers on one side
		eg $7g - 2g = -5 - 3$ **or** $5g = -8$			M1 for a correct rearrangement with terms in g on one side and numbers on the other. Award of this mark implies the first M1
		Working required	$-\frac{8}{5}$		A1 (dep on M1) oe eg $-1\frac{3}{5}$ or −1.6

24	(c)	$2d = 16 - 7$ or $2d = 9$ or $d + \frac{7}{2} = \frac{16}{2}$ oe or $(16 - 7) \div 2$ or $9 \div 2$		2	M1
		Correct answer scores full marks (unless from obvious incorrect working)	4.5		A1 accept $\frac{9}{2}$ or $4\frac{1}{2}$

25	$6 - 12x$ or $2 - 4x = \frac{5}{3} - \frac{8}{3}x$		3	M1 for expansion of bracket on the LHS or dividing the RHS by 3 with two terms
	$6 - 5 = 12x - 8x$ or $1 = 4x$ or $-12x + 8x = 5 - 6$ oe or $-4x = -1$ or $\frac{8}{3}x - 4x = \frac{5}{3} - 2$ oe or $2 - \frac{5}{3} = -\frac{8}{3}x + 4x$ oe			M1 ft (dep on 4 terms) for terms in x on one side of equation; number terms on the other
	Working required	$\frac{1}{4}$		A1 oe dep on M1 awarded
				Total 3 marks

26	(b)		7	1	B1
	(c)		18	1	B1 Look in body of script if nothing on answer line

27	eg $5x-1=3x+7.4$ oe **or** eg $10x-2+48$ **or** $6x+14.8+48$ **or** $24+24+5x-1+3x+7.4$ oe		4	M1 a correct equation to find x **or** a correct expression for the perimeter in terms of x
	$x=4.2$			A1 the correct value of x (implies previous mark)
	$2\times24+2(5\times$ "4.2" $-1)$ oe **or** $2\times24+2(3\times$ "4.2" $+7.4)$ oe **or** $2\times24+(5\times4.2-1)+(3\times4.2+7.4)$ oe eg $24+24+20+20$ oe			M1dep on a correct method to find the perimeter – use of positive x from correct working (1st M1 awarded for an equation) **and** only if used the same measurement for AD and BC
	working required	88		A1 cao dep on either M1 or $x=4.2$
				Total 4 marks

28 (c)	$4x=23+7$ **or** $4x=30$ oe **or** $x-\frac{7}{4}=\frac{23}{4}$ **or** $(23+7)\div4$ **or** $30\div4$		2	M1	for a correct first step **or** a correct calculation for x
	Correct answer scores full marks (unless from obvious incorrect working)	7.5		A1	oe eg $\frac{15}{2}$, $7\frac{1}{2}$, $\frac{30}{4}$

29 (c)		6	1	B1	cao
(d)	$4y=43-7$ oe **or** $\frac{4y}{4}+\frac{7}{4}=\frac{43}{4}$ oe **or** $(43-7)\div4$		2	M1	for a correct first step to solve the equation **or** a complete calculation for finding the value of y
	Correct answer scores full marks (unless from obvious incorrect working)	9		A1	

30	$(4x-27)+(3x+46)=180$ oe or "expression for C" $+(3x+10)=180$ **or** $7x+19=180$ **or** $3x+46+4x-27+3x+10+$ ["180 $-(3x+10)$" $]=360$		4	M1	Sum angles A and B to 180, or find an expression for BCD and sum all angles to 360. [condone missing brackets and condone use of any letter for angle C (even x or BCD)]
				A1	$x=23$
	eg $3\times$"23" $+46$ $(=115)$ **or** eg $180-(3\times$"23" $+10)$ $(=101)$			M1ft	dep on M1 using **their** x to calculate a value for angle B or C (cannot be a negative value and cannot just be x)
	Correct answer scores full marks (unless from obvious incorrect working)	115		A1	Allow $3x+46$ or ABC if 115 is clearly seen in working or on diagram
					Total 4 marks