1	$x = 0$	B1	

2	**Alternative method 1**		
	$2x + 20$	M1	correct expansion
	$x + 15 = 6x + 60$	M1dep	multiplication by 3
	$15 - 60 = 6x - x$ or $-45 = 5x$ or $60 - 15 = x - 6x$ or $45 = -5x$	M1dep	collects terms
	-9	A1	SC2 -3 from $2x + 10$ or 1 from $6x + 10$
	Alternative method 2		
	$2x + 20$	M1	correct expansion
	$\frac{x}{3} + 5 = 2x + 20$ and $5 - 20 = 2x - \frac{x}{3}$ or $-15 = \frac{5x}{3}$ or $20 - 5 = \frac{x}{3} - 2x$ or $15 = -\frac{5x}{3}$	M1dep	splits the fraction and collects terms
	$15 - 60 = 6x - x$ or $-45 = 5x$ or $60 - 15 = x - 6x$ or $45 = -5x$	M1dep	multiplication by 3
	-9	A1	SC2 -3 from $2x + 10$ or 1 from $6x + 10$
	The scheme for this question continues on the next page		

2 cont	**Alternative method 3**		
	$6(x + 10)$ or $6x + 60$	M1	multiplication of rhs by 3
	$x + 15 = 6x + 60$	M1dep	correct expansion
	$15 - 60 = 6x - x$ or $-45 = 5x$ or $60 - 15 = x - 6x$ or $45 = -5x$	M1dep	collects terms
	-9	A1	SC2 -3 from $2x + 10$ or 1 from $6x + 10$

3(a)	$(x + 2)^2 - 4 + b$ or $-4 + b = 8$	M1	
	12	A1	SC1 12 from $(x - 2)^2 - 4 + b$

4	$a = 7$	B2	B1 $3ax - 10a$ or $3ax = 21x$ or $3ax - 21x = 0$ or $3a = 21$ or $3a - 21 = 0$ or $21 \div 3$ oe or $-10a = 2b$ oe
	$b = -35$	B1ft	ft $-5 \times$ their a where $a \neq 0$
	Additional Guidance		
	Ignore collection error if correct expansion seen eg $3ax - 10a - 21x + 2b = 0$ (should be $-2b$)		B1
	Ignore incorrect simplification if correct expansion seen eg $3ax - 10a = -7ax$		B1
	Allow eg $a \times 3x$ for $3ax$		
	Allow eg $a3x$ for $3ax$		
	Embedded 7 with $a = 7$ not stated eg $7(3x - 10)$ or $7 \times 3x = 21x$ or $21 \div 7 = 3$		B1
	Allow B1 even if not subsequently used		

Q	Answer	Mark	Comments
5	$10x + 3x$ or $13x$ or $-3x - 10x$ or $-13x$	M1	may be implied eg $62.4 \div 13$ or $-62.4 \div -13$
	4.8 or $4\frac{4}{5}$ or $\frac{24}{5}$	A1	oe eg $\frac{624}{130}$
	Additional Guidance		
	$\frac{-24}{-5}$		M1A0
	Correct answer embedded eg $10 \times 4.8 = 62.4 - 3 \times 4.8$		M1A0
	Ignore conversion attempt after correct answer seen		

Q	Answer	Mark	Comments
6	$2w = \frac{4}{5} \times 15$ or $2w = \frac{60}{5}$ or $2w = 12$ or $\frac{2w}{15} = \frac{12}{15}$ or $\frac{w}{3} = \frac{2}{1}$ or $\frac{w}{2} = \frac{3}{1}$ or $\frac{w}{15} = \frac{4}{5} \div 2$ or $\frac{w}{15} = \frac{2}{5}$ or $2w \times 5 = 4 \times 15$ or $10w = 60$ or $\frac{4}{5} \div \frac{2}{15}$	M1	oe in the form $aw = n$ where a is an integer and n is an integer, fraction or decimal oe in the form $\frac{bw}{x} = \frac{c}{x}$ where x is a common denominator oe calculation
	6	A1	
	Additional Guidance		
	Embedded answer 6 eg $\frac{2 \times 6}{15} = \frac{4}{5}$		M1A0

Q	Answer	Mark	Comments
7	**Alternative method 1**		
	$10x - 5$	M1	may be seen in a grid
	their $10x - 6x = 9 +$ their 5 or $4x = 14$ or $14 \div 4$ or $7 \div 2$	M1	oe eg their $-5 - 9 = 6x -$ their $10x$ or $4x - 14 = 0$ collecting two terms in x and two constant terms correctly
	$\frac{14}{4}$ or $3\frac{2}{4}$ or $\frac{7}{2}$ or $3\frac{1}{2}$ or 3.5	A1ft	oe ft M1M0 or M0M1 with exactly one error
	Alternative method 2		
	$\frac{6x}{5} + \frac{9}{5}$	M1	oe two terms eg $1.2x + 1.8$
	$2x -$ their $\frac{6x}{5} =$ their $\frac{9}{5} + 1$ or $\frac{4x}{5} = \frac{14}{5}$	M1	oe eg $-1 -$ their $\frac{9}{5} =$ their $\frac{6x}{5} - 2x$ or $\frac{4x}{5} - \frac{14}{5} = 0$ collecting two terms in x and two constant terms correctly
	$\frac{14}{4}$ or $3\frac{2}{4}$ or $\frac{7}{2}$ or $3\frac{1}{2}$ or 3.5	A1ft	oe ft M1M0 or M0M1 with exactly one error

	Additional Guidance	
7 cont	Ignore simplification or conversion if correct answer seen	
	Correct answer from trial and improvement	M1M1A1
	Correct equation with terms collected or division with no or incorrect answer	M1M1A0
	Embedded 3.5 with no or incorrect answer	M1M1A0
	$10x - 5 = 6x + 9$ $10x - 6x = 9 - 5$ $x = 1$ (exactly one error in line 2)	M1 M0 A1ft
	$7x - 5 = 6x + 9$ $7x - 6x = 9 + 5$ $x = 14$ (exactly one error in line 1)	M0 M1 A1ft
	$10x - 5 = 6x + 9$ $10x + 6x = 9 - 5$ $x = \frac{4}{16}$ (two errors in line 2)	M1 M0 A0ft
	$10x - 1 = 6x + 9$ $10x - 6x = 9 + 1$ $x = 3$ (exactly one error in line 1 but answer does not ft)	M0 M1 A0ft
	$7x - 6 = 6x + 9$ $7x - 6x = 9 + 6$ $x = 15$ (two errors in line 1)	M0 M1 A0ft
	$10x + 4 = 6x + 9$ $10x - 6x = 9 + 4$ $x = 3.25$ (neither M mark scored)	M0 M0 A0ft
	$10x - 5 = 30x + 45$	M1M0A0ft
	Any ft answer must be rounded or truncated to 1 dp or better	
	The last two marks can be implied without the collection of terms seen eg $10x - 1 = 6x + 9$ and $x = 2.5$	M0M1A1ft
	Collecting terms before the bracket has been expanded	M0M0A0ft

Q	Answer	Mark	Comments
8	$a = 8$ and $b = 6$	B2	B1 $a - 3 = 5$ or $a = 3 + 5$ or $a = 8$ or $2b = 12$ or $b = 12 \div 2$ or $b = 6$ SC1 $a = 6$ and $b = 8$
	Additional Guidance		
	Ignore working if B2 or B1 or SC1 seen		
	$(a - 3)x^2 = 5x^2$ with no further correct work		B0
	For B1 do not allow embedded values eg $2 \times 6 = 12$		B0

Q	Answer	Mark	Comments
9	$5x - 3x$ or $2x$ or $3x - 5x$ or $-2x$ or $19 - 11$ or 8 or $11 - 19$ or -8	M1	
	4	A1	
	Additional Guidance		
	Answer 4 with no working or no incorrect working		M1A1
	Embedded answer eg $5 \times 4 + 11 = 3 \times 4 + 19$		M1A0

Q	Answer	Mark	Comments
10	**Alternative method 1 – multiplies through by 10 or common denominator of 10**		
	$5(x + 8) + 2(9 – x)$ or $5x + 40 + 18 – 2x$	M1	oe numerator on the left-hand side if written as a fraction allow one error or omission in the expansion if brackets not seen eg $5x + 18 – 2x$
	$3x + 58$	A1	may be implied by eg $3x + 18 = 0$ or $3x = –18$
	their $(3x + 58) = 4 \times$ (their 10) or their $(3x + 58) = 40$ or $3x + 18 = 0$ or $3x = –18$	M1	oe allow an unsimplified expression for their $(3x + 58)$ equation may be implied by answer
	–6	A1ft	ft M1A0M1
	Alternative method 2 – collects terms with fractions		
	$\frac{x}{2} + 4 + \frac{9}{5} – \frac{x}{5}$	M1	oe eg $0.5x + 4 + 1.8 – 0.2x$ allow one error
	$\frac{3}{10}x + \frac{29}{5}$	A1	oe eg $0.3x + 5.8$
	$\frac{3}{10}x = \frac{20}{5} – \frac{29}{5}$ or $\frac{3}{10}x = -\frac{9}{5}$	M1	oe eg $0.3x = –1.8$ terms must be collected
	–6	A1ft	ft M1A0M1

	Additional Guidance	
10 cont	Accept decimal answers for follow through correct to 1 dp or better	
	Apply the principles of alt 1 for any use of other common denominators eg common denominator of 20 (or multiplication through by 20) $10(x + 8) + 4(9 - x) = 6x + 116$ $6x + 116 = 80$ $x = -6$	M1A1 M1A1
	An incorrect simplification of $5x + 40 + 18 - 2x$ may still gain the third and fourth marks eg $5x + 40 + 18 - 2x = 3x + 68$ followed by $3x + 68 = 40$ and $x = -\frac{28}{3}$ eg $5x + 40 + 18 - 2x = 2x + 68$ followed by $2x + 68 = 40$ and $x = -14$	M1A0M1 A1ft M1A0M1 A1ft
	An incorrect denominator may still gain the third and fourth marks $\frac{5x+40+18-2x}{7}$ followed by $5x + 40 + 18 - 2x = 28$ and $x = -10$	M1A0M1 A1ft
	Denominator not processed $3x + 58 = 4$ followed by $3x = -54$ and $x = -18$	M1A1M0A0
	$(x + 8) + (9 - x) = 40$	M0A0M1A0
	Two errors in the expansion but with brackets seen may go on to get the third and fourth marks $5(x + 8) + 2(9 - x) = 5x + 8 + 18 - x$	1st M1A0
	Two errors in the expansion and no brackets seen, no follow through allowed $5x + 8 + 18 - x$ followed by $4x + 26 = 40$ and $x = \frac{14}{4}$	M0A0M1A0

Q	Answer	Mark	Comments
11	$7x - 4x$ or $3x$ or $4x - 7x$ or $-3x$ or $-22 - 29$ or -51 or $22 + 29$ or 51	M1	
	$3x = 51$ or $-3x = -51$	A1	$\frac{51}{3}$ or $\frac{-51}{-3}$ implies M1A1 implied by correct answer
	17	A1ft	ft M1A0 from an equation of the form $\pm 3x = a$ or $bx = \pm 51$
	Additional Guidance		
	Trial and improvement scores 0 or 3		
	If a follow through answer does not simplify to an integer, accept it as a fraction, mixed number or decimal to at least 1dp. eg from $3x = 7$ accept $\frac{7}{3}$ or $2\frac{1}{3}$ or 2.3 or better Ignore any attempt to convert a correct ft fraction		M1A0A1ft
	Embedded answer		M1A1A0