

1	$\frac{y+3}{2} = x$ or $x = 2y - 3$ and $x + 3 = 2y$ or $2x - 3 = 55$	M1	
	$\frac{x+3}{2}$ or $\frac{55+3}{2}$	A1	
	$2x^2 - 3$ or $2 \times 4^2 - 3$ or $2 \times 16 - 3$	M1	
	$\frac{55+3}{2} = 29$ and $2 \times 4^2 - 3 = 29$ or $2 \times 16 - 3 = 29$	A1	
	Additional Guidance		
	29 with no working or only from incorrect working		MOA0MOA0

Question	Answer	Mark	Comments
2(a)	$\frac{2x-1}{2}$	B1	

Q	Answer	Mark	Comments
3	$x = 2y + 5$ or $x - 5 = 2y$ or $y - 5 = 2x$ or $\frac{y-5}{2}$	M1	oe eg $x = 2f^{-1} + 5$ or $f(x) - 5 = 2x$
	$\frac{x-5}{2}$	A1	oe eg $\frac{x}{2} - \frac{5}{2}$ may be implied eg by $12f^{-1}(x) = 6(x - 5)$ implied by $\frac{y-5}{2}$ if $\frac{x-5}{2}$ used in subsequent working
	Correctly expands $3(2x + 5) - 12 \times$ their $\frac{x-5}{2}$ to a linear expression	M1	$6x + 15 - 6x + 30$ if M1A1 their $\frac{x-5}{2}$ must be a function of x their $\frac{x-5}{2}$ cannot be $2x + 5$ implied by a correct linear expression or value for $3(2x + 5) - 12 \times$ their $\frac{x-5}{2}$
	$\frac{x-5}{2}$ and 45	A1	
	Additional Guidance		
	45 with no working		Zero
	45 from wrong working does not score 4 marks – mark the working seen		
	First A1 Condone $y = \frac{x-5}{2}$ or $f = \frac{x-5}{2}$ or $f(x) = \frac{x-5}{2}$ or $x = \frac{x-5}{2}$		
	For $6x + 15 - 6x + 30$ allow $\frac{12x + 30 - 12x + 60}{2}$ but not $6x + 15 - \frac{12x - 60}{2}$		
	$x = 2y + 5$ $\frac{x+5}{2}$ $6x + 15 - \frac{12x}{2} - \frac{60}{2}$ (implied by -15)		M1A0 M1A0
	$-2x - 5$ $6x + 15 + 24x + 60$ (implied by $30x + 75$)		M0A0 M1A0

Q	Answer	Mark	Comments
4	$3x^2$	B1	

Q	Answer	Mark	Comments
5(a)	$(2x + 4)^2 + 6(2x + 4)$	M1	may be seen in a grid
	$4x^2 + 8x + 8x + 16 + 12x + 24$ or $4x^2 + 16x + 16 + 12x + 24$	M1dep	fully expanded expression with terms summed allow one omission or one arithmetic error
	$4x^2 + 8x + 8x + 16 + 12x + 24$ or $4x^2 + 16x + 16 + 12x + 24$ and $4x^2 + 28x + 40$	A1	
	Additional Guidance		
	$4x^2 + 16 + 12x + 24$ is two errors		

Q	Answer	Mark	Comments
5(b)	$4x^2 + 28x + 45 (= 0)$	M1	must be correct
	$(2x + 5)(2x + 9) (= 0)$ or $(2x + 7)^2 - 49 + 45 (= 0)$ or $\frac{-28 \pm \sqrt{28^2 - 4 \times 4 \times 45}}{2 \times 4}$ or $\frac{-28 \pm \sqrt{64}}{8}$ or $\frac{-28 \pm 8}{8}$ or $\frac{-7 \pm \sqrt{4}}{2}$	M1dep	oe implies first M1
	$(x =) -2.5$ and $(x =) -4.5$	A1	oe fraction or decimal SC2 $(x =) [-1.63, -1.629]$ and $(x =) [-5.371, -5.37]$
	Additional Guidance		
	SC2 from using $4x^2 + 28x + 35 (= 0)$		
	Trial and improvement with both answers correct and chosen from any list		M1M1A1
	Trial and improvement with one answer correct		M0M0A0

Q	Answer	Mark	Comment
6(a)	Alternative method 1		
	$6\left(\frac{3x+9}{5}\right) - 1$	M1	oe eg $\frac{18x+49}{5}$
	17	A1	SC1 8.4 oe value
	Alternative method 2		
	$\frac{3 \times 2 + 9}{5}$ or 3 or g(3)	M1	oe eg $6 \times 3 - 1$
	17	A1	SC1 8.4 oe value
	Additional Guidance		
	Answer 17		M1A1
	Working out f(2) and g(2) is M0 unless recovered eg1 $\frac{3 \times 2 + 9}{5} = 3$ $6 \times 2 - 1 = 11$ eg2 $3 \times 11 = 33$		M0A0 M0A0
	17 followed by further work eg $17 \times 3 = 51$		M1A0
	SC1 is for fg(2)		

Q	Answer	Mark	Comment
6(b)	Alternative method 1		
	$\frac{5x-9}{3}$ or $\frac{5y-9}{3}$ or $\frac{5 \times 8 - 9}{3}$	M1	oe
	$\frac{31}{3}$ or $10\frac{1}{3}$ or 10.3(...)	A1	
	Alternative method 2		
	$\frac{3x+9}{5} = 8$	M1	oe equation
	$\frac{31}{3}$ or $10\frac{1}{3}$ or 10.3(...)	A1	
	Additional Guidance		
	$\frac{31}{3}$ or $10\frac{1}{3}$ or 10.3(...)		M1A1
	Ignore conversion attempt after correct answer seen		

Q	Answer	Mark	Comments
7(a)	Alternative method 1		
	$4 \times 6 - 7$ or $24 - 7$ or 17	M1	
	14	A1	
	Alternative method 2		
	$4x - 7 - 3$ or $4x - 10$	M1	
	14	A1	
Q	Answer	Mark	Comments
7(b)	$(x - 3)^2 = 4x - 7$ or $x^2 - 6x + 9 = 4x - 7$	M1	oe equation
	$x^2 - 10x + 16 (= 0)$	M1dep	oe their 3-term quadratic equation with terms collected correctly
	$(x - 2)(x - 8)$ or $\frac{- -10 \pm \sqrt{(-10)^2 - 4 \times 1 \times 16}}{2 \times 1}$ or $5 \pm \sqrt{9}$	M1	oe correct for their 3-term quadratic
	$x = 2$ and $x = 8$	A1	
	Additional Guidance		
	$(x - 3)^2 = 4x - 7$ $x^2 + 9 = 4x - 7$ $x^2 - 4x + 16 (= 0)$		M1M1
	$(x - 3)^2 = 4x - 7$ $x^2 + 9 = 4x - 7$ $x^2 - 4x + 2 (= 0)$ $x = 2 \pm \sqrt{2}$ correct answers imply 3rd M		M1M0M1A0
	$(x - 3)^2 = 4x - 7$ $x^2 + 9 = 4x - 7$ $x^2 - 4x + 2 (= 0)$		M1M0