

OCR GCSE 9-1 Functions PPQ SOLUTIONS [34]

1.

(a)	(i)	-13	1 1 AO1.3a		
	(ii)	15	1 1 AO1.3a		
	(iii)	$\frac{x+3}{5}$ oe	2 1 AO1.1 1 AO1.3a	M1 for correct first step $5x = y + 3$ or a flow diagram with + 3 and + 5	Accept equivalent flow diagram
(b)		3 2	4 1 AO1.3b 3 AO3.1b	B1 for 17 or 42 M2 for $(128 - 53) \div (42 - 17)$ oe or 3 Or M1 for $128 - 53$ or $42 - 17$ or 75 or 25	Alternative: B1 for $17d + e = 53$ B1 for $42d + e = 128$ M1 for a subtraction with at most one error e.g. $25d = 75$

[8 marks]

2.

(a)		$24x + 64$ or $8(3x + 8)$	2 2 AO1.3a	M1 for $3x + 6$ seen	
(b)		-2	3 1 AO1.3a 2 AO3.1a	M1 for $3'x' + 6 = 8('x' + 2)$ oe M1 for $5'x' = -10$	Form equation Begin to solve for 'x'

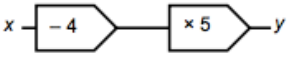

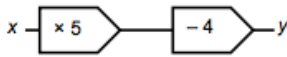

[5 marks]

3.

(a)	(i)	-1	2 1 AO1.3a 1 AO3.1a	M1 for use of -5 and $+2$ soi Or M1 for answer 3	
	(ii)	-5	3 1 AO1.3a 2 AO3.1a	M1 for $2x + 5$ M1 for $x = \textit{their} '2x + 5'$ and solve	
(b)		5, 10	3 1 AO1.3a 2 AO3.1a	M1 for $3a + b = 5$ and $7a + b = 25$ M1 for attempt to solve Or M1 input increases by 4; output increases by 20 M1 so one box must have $\times 5$ for the arithmetic sequence	Condone $\frac{x^2+1}{2}$ across the two boxes for 3 marks

[8 marks]

4.

a	<table border="1" style="margin-left: auto; margin-right: auto;"> <tr> <td style="padding: 5px;">x</td> <td style="padding: 5px;">y</td> </tr> <tr> <td style="padding: 5px;">-5</td> <td style="padding: 5px;">-4</td> </tr> <tr> <td style="padding: 5px;">2.5</td> <td style="padding: 5px;">11</td> </tr> </table>	x	y	-5	-4	2.5	11	<p style="text-align: center;">2 2 AO1.3a</p>	<p>B1 for one correct</p>	
x	y									
-5	-4									
2.5	11									
b	<p>$y = 5(x - 4)$ oe</p> <p>or</p> 	<p style="text-align: center;">2 1 AO1.1 1 AO1.3a</p>	<p>M1 for correct operations in correct order but poor notation eg $y = x - 4 \times 5$ or $5(x - 4)$ oe</p>  <p>(as minimum allow -4, $\times 5$ if intent clear)</p> <p>or for correct operations in reverse order eg implied by $y = 5x - 4$</p> 	<p>For 2 marks and M1 condone x and y transposed in algebraic expression or transposed in flow diagram.</p> <p>M0 for wrong order and poor notation</p>  <p>Mark right-to-left flow diagrams in a similar way</p> <p>Condone correct flow diagram followed by incorrect algebra or vice-versa</p>						
c	<p>$5p - 3$ as final answer</p>	<p style="text-align: center;">4 1 AO1.3b 3 AO3.1b</p>	<p>M1 for $2p + 4 - 4$ soi M1 for <i>their</i> $2p \times 5$ soi M1 for <i>their</i> $10p \div 2$ M1 for <i>their</i> $5p - 3$ Maximum 3 marks if answer incorrect</p> <p>Alternative method: M1 for $2(m + 3)$ soi <i>their</i> $\frac{2(m+3)}{5} + 4$ soi M1 for <i>their</i> $\frac{2(m+3)}{5} + 4 = 2p + 4$ or better</p> <p>M1FT for rearranging <i>their</i> equation to isolate m</p> <p>Maximum 3 marks if answer incorrect</p>	<p>Output of function A is $10p$ implies first M1M1</p> <p>Use of function A</p> <p>Use of function B with output of A</p> <p>Equating their output of B with $2p + 4$</p> <p><i>Their</i> equation must be of form $\frac{am + b}{5} + 4 = 2p + 4$ oe where $a \neq 0$ and $b \neq 0$, leading to $(m =) \frac{10p - b}{a}$ and then simplified if possible</p> <p>Accept another letter used consistently for m or p but not m and p interchanged</p>						

[8 marks]

5.

(a)	<p>$\frac{x}{5} - 14$ oe</p>	<p style="text-align: center;">2</p>	<p>M1 for $\frac{x}{5}$</p> <p>If 0 scored then SC1 for $\frac{x - 14}{5}$ oe</p>	<p>Condone use of another letter for M1 max</p> <p>Must use x in SC1 0 for $x - 14 \div 5$</p>
(b)	<p>-17.5 or $-\frac{35}{2}$ oe nfw</p>	<p style="text-align: center;">3</p>	<p>M1 for $5('k' + 14) = 'k'$ or $'k' = \frac{k}{5} - 14$</p> <p>M1FT for $4'k' = -70$ or better or re-arrangement of <i>their</i> comparable $f(k) = g(k)$ equation into the form $ak = b$.</p> <p>M1FT solving <i>their</i> $ak = b$</p> <p>Alternative (FT as above): M1 for $'k' = \frac{k}{5} - 14$ M1FT for $\frac{4k}{5} = -14$ or better M1FT solving <i>their</i> $ak = b$</p> <p>Trials or no working: SC3 for -17.5</p>	<p>eg $5k + 14 = k$ becomes $4k = -14$ and then $k = -3.5$ scores M0 M1FT M1FT $k + 70 = k$ is not comparable</p> <p>Answers may be in decimal or fractional form but fractions equating to integers should be simplified</p>

[5 marks]