Q	Answer	Mark	Comments
1	$\sqrt[4]{81}$ or $81^{\frac{1}{4}}$ or $k = 3$	M1	may be seen on diagram and is implied by $p = 9$
	(their value for $k)^2 = 2^2 + c$ or $9 = 4 + c$ or $c = 5$	M1	does not need to be evaluated
	r^2 + their 5 = 43.44 or $\sqrt{43.44 - \text{their } 5}$ or $\sqrt{38.44}$	M1dep	oe equation dep on previous mark
	6.2	A1	
	Additional Guidance		
	Coordinate (2, 9) implies $p = 9$		

Q	Answer	Mark	Comments
2(a)	(0, 2)	B1	
	Additional Guidance		

Q	Answer	Mark	Comments
2(b)	$y = -x^2$	B1	oe equation eg $x^2 = -y$
	Additional Guidance		
	$y = -1x^2 + 0$		B1
	$y = -(x^2)$		B1
	$-x^2$		B0

Q	Answer	Mark	Comments
2(c)	Translation	B1	allow eg translate(d)
	$\begin{pmatrix} -3 \\ 0 \end{pmatrix}$	B1	
	Additional Guidance		
	Do not accept a vector given as coordinates or with missing brackets or with 'fraction line'		
	Translation from (0, 0)		B1B0
	Translation horizontally by 3		B1B0
	Translate 3 to the left and 3 down		B1B0
	Reflect by $\begin{pmatrix} -3 \\ 0 \end{pmatrix}$		B0B1
	Giving a combined transformation is B0B0 Rotate by $\begin{pmatrix} -3 \\ 0 \end{pmatrix}$ and reflect in the x-axis		B0B0
	Ignore references to movement if vector is correct eg Move to the right by $\begin{pmatrix} -3 \\ 0 \end{pmatrix}$		B0B1

Q	Answer	Mark	Comments
3(a)	0 and 3 in the correct positions	B2	B1 0 or 3 in the correct position
	Additional Guidance		
	x | –3 | –2 | –1 | 0 | 1 y | 3 | 0 | –1 | 0 | 3	B2	

Q	Answer	Mark	Comments
3(b)	Plots at least three points correctly	M1	correct or ft their table in (a) $\pm\frac{1}{2}$ small square points may be implied by graph passing through them
	Correct graph drawn through the five correct points	A1	$\pm\frac{1}{2}$ small square smooth quadratic curve
	Additional Guidance		
	Correct graph drawn without plotting the correct points		M1A1
	Ignore any extra points plotted		
	Ignore any part of graph drawn for $x < -3$ or $x > 1$		
	Ruled straight lines		A0

Q	Answer	Mark	Comment
4	$4 = 0^2 + p \times 0 + r$ or $r = 4$	M1	oe equation may be implied
	$1^2 + p\ (\times 1) +$ their $4 = 3$ or $p = -2$	M1	oe equation allow their 4 to be r
	$8^2 +$ (their -2) $\times 8 +$ their 4 or $64 - 16 + 4$	M1dep	oe dep on M1M1 do not allow their 4 to be r
	52	A1	

Q	Answer	Mark	Comments
5(a)	$15 = 3^2 + c$ or $(c =)\ 6$	M1	oe
	7^2 + their 6	M1dep	oe
	55	A1	

Q	Answer	Mark	Comments
5(b)	It is impossible to tell	B1	

Q	Answer	Mark	Comments
6	$(x =)\ -2.2,\ 1.5$	B2	B1 at least one of –2.2 and 1.5 with at most one incorrect value or (–2.2, 0) and (1.5, 0) or (–2.2, 1.5)
	Additional Guidance		
	(1.5, –2.2)		B0
	(0, –2.2) and (0, 1.5)		B0