

01. 0607_m24_ms_42 Q: 3

Question	Answer	Marks	Partial Marks
(a)	Translation $\begin{pmatrix} -7 \\ 2 \end{pmatrix}$	2	B1 for each
(b)	Enlargement [sf] $-\frac{1}{2}$ [centre] $(-1, 3)$	3	B1 for each
(c)(i)	Triangle at $(1, -3), (5, -3), (1, -5)$	2	B1 for rotation 90° anticlockwise about $(-1, -1)$ or for rotation 90° clockwise about wrong centre
(c)(ii)	Triangle at $(-3, -3), (-7, -3), (-3, -5)$	2	FT <i>their</i> (c)(i) B1 for reflection in $x = k$ or $y = -1$
(c)(iii)	Reflection $y = -x - 2$ oe	2	B1 for each

02. 0607_s24_ms_41 Q: 3

Question	Answer	Marks	Partial Marks
(a)	Correct triangle $(-5, 0), (-5, -3), (-4, -3)$	2	B1 for translation $\begin{pmatrix} 2 \\ k \end{pmatrix}$ or $\begin{pmatrix} k \\ -6 \end{pmatrix}$

Question	Answer	Marks	Partial Marks
(b)	Translation $\begin{pmatrix} -2 \\ 6 \end{pmatrix}$	2	B1 for each
(c)	Correct triangle $(3, 6), (3, 7), (6, 7)$	2	B1 for correct rotation, incorrect centre or for correct rotation 90° anticlockwise
(d)	Correct triangle $(3, -6), (3, -7), (6, -7)$	2	B1 for correct size and orientation, wrong position or reflection in $y = -x$
(e)	Rotation 90° anticlockwise oe [Centre] $(4, -2)$	3	B1 for each

03. 0607_s24_ms_42 Q: 8

Question	Answer	Marks	Partial Marks
(a)(i)	Translation $\begin{pmatrix} 3 \\ 2 \end{pmatrix}$	2	B1 for each
(a)(ii)	Enlargement (or reduction) [scale factor] $\frac{1}{2}$ oe [centre] (5, 1)	3	B1 for each
(b)(i)	(2, -5)	1	
(b)(ii)	8.6[0] or 8.602...	2	M1 for $5^2 + (-7)^2$ or $5^2 + 7^2$ or better
(c)	[y=] $3x + 8$	3	M1 for $\frac{11-1}{1-3}$ (m) oe M1 for substituting (-3, -1) or (1, 11) into $y = (\text{their } m)x + c$ oe

04. 0607_s24_ms_43 Q: 6

Question	Answer	Marks	Partial Marks
(a)(i)	Triangle at (1, -2), (4, -2), (3, -3)	2	B1 for reflection in $y = -x$ or correct size and orientation
(a)(ii)	Rotation 90° clockwise oe [centre] (4, 1)	3	B1 for each
(a)(iii)	Enlargement [Scale factor] -2 [centre] (-1, 3)	3	B1 for each
(b)(i)	Translation $\begin{pmatrix} 3 \\ -4 \end{pmatrix}$	2	B1 for each
(b)(ii)	Stretch $y = 1$ [invariant] factor $\frac{1}{3}$	3	B1 for each

05. 0607_m23_ms_42 Q: 2

Question	Answer	Marks	Partial Marks
(a)	Translation $\begin{pmatrix} -11 \\ -13 \end{pmatrix}$	2	B1 for each
(b)	Rotation 90 clockwise oe [Centre] (4, 9)	3	B1 for each
(c)	Correct triangle (-6, 8) (-6, 7) (-3, 7)	2	B1 for correct reflection in $y = k$,
(d)	Correct triangle (-6, -6) (-6, -4) (0, -4)	2	B1 for correct SF enlargement, incorrect position

06. 0607_s23_ms_42 Q: 3

Question	Answer	Marks	Partial Marks
(a)	Triangle at (1, -6), (2, -4), (4, -4)	2	B1 for reflection in $x = -1$ or $y = k$
(b)	Triangle at (-4, 7), (-3, 5), (-1, 5)	2	B1 for translation $\begin{pmatrix} -5 \\ k \end{pmatrix}$ or $\begin{pmatrix} k \\ 3 \end{pmatrix}$

Question	Answer	Marks	Partial Marks
(c)	Rotation 90° [anticlockwise] oe [Centre] origin or (0, 0)	3	B1 for each
(d)	Stretch [Factor] 2 x -axis (or $y = 0$) invariant	3	B1 for each

07. 0607_s23_ms_43 Q: 1

Question	Answer	Marks	Partial Marks
(a)	Correct triangle (-5, 5) (-5, 7) (-6, 7)	2	B1 for translation by $\begin{pmatrix} -6 \\ k \end{pmatrix}$ or $\begin{pmatrix} k \\ 4 \end{pmatrix}$
(b)	Rotation 90 clockwise oe Centre (2, 0)	3	B1 for each
(c)	Correct triangle (-5, 1) (-5, 3) (-4, 3)	2	B1 for correct reflection in $x = k$ or in $y = -2$
(d)	Correct triangle (-1, -1) (0, -3) (-1, -3)	2	B1 for correct enlargement, incorrect centre

08. 0607_w23_ms_42 Q: 1

Question	Answer	Marks	Partial Marks
(a)	triangle $(-6, -2) (-4, -2) (-4, -5)$	2	B1 for reflection in $y = -1$ or reflection in $x = k$
(b)	triangle $(3, 2) (5, 2) (3, -1)$	2	B1 for translation $\begin{pmatrix} 1 \\ k \end{pmatrix}$ or $\begin{pmatrix} k \\ 4 \end{pmatrix}$
(c)	rotation 180° [centre] $(0, 0)$ oe OR enlargement [centre] $(0, 0)$ oe [sf] -1	3	B1 for each
(d)	triangle $(-1, 2) (0, 5) (0, 2)$	2	B1 for correct shape but translated horizontally from correct position.

09. 0607_w23_ms_43 Q: 3

Question	Answer	Marks	Partial Marks
(a)	Triangle at $(-4, 4), (-2, 4), (-4, 3)$	2	B1 for translation through $\begin{pmatrix} -5 \\ k \end{pmatrix}$ or $\begin{pmatrix} k \\ 2 \end{pmatrix}$
(b)	Enlargement [Scale Factor] -2 [Centre] $(2, 3)$	3	B1 for each
(c)(i)	Triangle at $(-2, -1), (-1, -1), (-2, -3)$	4	B2 for triangle at $(1, -3), (1, -4), (3, -4)$ or B1 for reflection in $y = k$ or $x = -1$ dep B1 for rotation of <i>their</i> first image 90° clockwise or anticlockwise about $(1, -1)$ or rotation 90° clockwise about wrong centre. If 0 scored, SC1 for correct triangle translated
(c)(ii)	Reflection $y = -x$ oe	2	B1 for each

10. 0607_w20_ms_42 Q: 12

Question	Answer	Marks	Partial Marks
(a)(i)	Vector $\begin{pmatrix} 6 \\ 4 \end{pmatrix}$ drawn	1	
(a)(ii)	Vector $\begin{pmatrix} -2 \\ 1 \end{pmatrix}$ drawn	1	
(a)(iii)	Vector $\begin{pmatrix} -1 \\ 4 \end{pmatrix}$ drawn	2	B1 for vector $\begin{pmatrix} -1 \\ k \end{pmatrix}$ or vector $\begin{pmatrix} k \\ 4 \end{pmatrix}$ drawn or $\begin{pmatrix} -1 \\ 4 \end{pmatrix}$ seen

Question	Answer	Marks	Partial Marks
(b)	$2p - q = 10$ $3p + 4q = -7$	B1	
	Equalising coefficients and adding or subtracting appropriately, or expression for one variable in terms of the other and correctly substituted, or rearranged equations seen and sketch of both lines intersecting.	M1	
	$p = 3, q = -4$	A2	A1 for each If M0 A0 scored, SC1 for $p = 3, q = -4$ with no working or their answers satisfying one equation

Paper Perfection, Crafted With Passion

11. 0607_s19_ms_41 Q: 7

Question	Answer	Marks	Partial Marks
(a)	Vector $\begin{pmatrix} 4 \\ 2 \end{pmatrix}$ drawn Vector $\begin{pmatrix} 2 \\ 5 \end{pmatrix}$ drawn Vector $\begin{pmatrix} -4 \\ 0 \end{pmatrix}$ drawn	3	B1 for each with arrows If 0 scored SC1 for all three without arrows or all incorrect arrows
(b)	[p =] $-3\mathbf{b}$ oe [q =] $3\mathbf{a} + 3\mathbf{b}$ oe [r =] $2\mathbf{b} - \mathbf{a}$ oe	3	B1 for each

12. 0607_w19_ms_43 Q: 6

Question	Answer	Marks	Partial Marks
(a)	(11, -9)	2	B1 for each co-ordinate
(b)(i)	$-\mathbf{a} + \mathbf{b}$	1	
(b)(ii)	$\frac{3}{7}\mathbf{a} + \frac{4}{7}\mathbf{b}$ or $\frac{1}{7}(3\mathbf{a} + 4\mathbf{b})$	3	B2 for unsimplified or B1 for $\overline{OA} + \frac{4}{7}\overline{AB}$ oe or a correct route


AcelGCSE
 Paper Perfection, Crafted With Passion

13. 0607_w18_ms_41 Q: 10

Question	Answer	Marks	Partial Marks
(a)(i)	$-6\mathbf{a} + 6\mathbf{c}$ oe	1	
(a)(ii)	$\frac{2}{3}(-6\mathbf{a} + 6\mathbf{c})$ oe	1	FT <i>their (a)(i)</i> if a vector
(a)(iii)	$-4\mathbf{a}$	2	M1 for <i>their (a)(ii)</i> + $\frac{2}{3}\overrightarrow{CO}$ or correct unsimplified route
(b)	Both multiples of \mathbf{a} oe	1	Depends on (a)(iii) being a multiple of \mathbf{a}
(c)	Angle $OAX = \text{angle } BDX$ Angle $OXA = \text{angle } BXD$	2	Two correct statements B1 for one correct statement
(d)(i)	$-6\mathbf{a} + 2\mathbf{c}$ oe	2	B1 for a correct route eg $\overrightarrow{AO} + \overrightarrow{OD}$ or for $-6\mathbf{a} + k\mathbf{c}$ or for $k\mathbf{a} + 2\mathbf{c}, k \neq 0$
(d)(ii)	$\frac{1}{5}(-12\mathbf{a} + 4\mathbf{c})$ oe	2	M1 for $3\overrightarrow{XD} = 2(-6\mathbf{a} + 2\mathbf{c} - \overrightarrow{XD})$ or $\frac{2}{5}(\text{their (d)(i)})$
(e)	9 : 4 oe	2	B1 for 3 : 2 oe soi or for 1.5^2 or $\left(\frac{2}{3}\right)^2$ seen

14. 0607_w18_ms_42 Q: 13

Question	Answer	Marks	Partial Marks
(a)(i)	$-\mathbf{a} + \mathbf{b}$	1	
(a)(ii)	$\frac{2}{5}\mathbf{a} + \frac{3}{5}\mathbf{b}$	2	B1 for unsimplified seen or M1 for $\mathbf{a} + \frac{3}{5}\overrightarrow{AB}$ oe or $\mathbf{b} + \frac{2}{5}\overrightarrow{BA}$ oe
(b)(i)	$\frac{2}{3}\mathbf{a}$	2	B1 for unsimplified seen or M1 for $-\mathbf{b} + \frac{5}{3}\text{their (a)(ii)}$
(b)(ii)	\overrightarrow{BQ} is a multiple of \mathbf{a} oe	1	Dep on (b)(i) = $k\mathbf{a}, k \neq 1$

15. 0607_w18_ms_43 Q: 3

Question	Answer	Marks	Partial Marks
(a)(i)	$\begin{pmatrix} 1 \\ 3 \end{pmatrix}$	1	
(a)(ii)	$\begin{pmatrix} 4 \\ -2 \end{pmatrix}$	1	
(a)(iii)	4.47 or 4.472...	2	FT <i>their</i> (ii) M1 for $(\textit{their } 4)^2 + (\textit{their} - 2)^2$
(b)(i)	$\begin{pmatrix} 2 \\ 5 \end{pmatrix}$	2	B1 for $\begin{pmatrix} 2 \\ k \end{pmatrix}$ or $\begin{pmatrix} k \\ 5 \end{pmatrix}$ If 0 scored, SC1 for $\begin{pmatrix} 2 \\ 5 \end{pmatrix}$
(b)(ii)	(6, 17)	2	B1 for (6, <i>k</i>) or (<i>k</i> , 17)

16. 0607_s17_ms_43 Q: 11

Question	Answer	Marks	Part Marks
(a)(i)	$-\mathbf{a} + \mathbf{b}$ oe	1	
(a)(ii)	$-\frac{1}{4}\mathbf{a} + \frac{1}{4}\mathbf{b}$ oe	1	FT <i>their</i> (i)
(a)(iii)	$\frac{3}{4}\mathbf{a} + \frac{1}{4}\mathbf{b}$ oe	2	B1 for correct unsimplified answer or a correct route
(b)	(6.5, 1.5)	3	FT <i>their</i> (a)(iii) B2 for $\begin{pmatrix} 6.5 \\ 1.5 \end{pmatrix}$ or M1 for $\frac{3}{4} \times \begin{pmatrix} 8 \\ 0 \end{pmatrix} + \frac{1}{4} \times \begin{pmatrix} 2 \\ 6 \end{pmatrix}$ OR B2 for (5, 3) at <i>M</i> or $[\overline{OM} =] \begin{pmatrix} 5 \\ 3 \end{pmatrix}$ or B1 for (<i>k</i> , 3) or (5, <i>k</i>) at <i>M</i> or $[\overline{OM} =] \begin{pmatrix} k \\ 3 \end{pmatrix}$ or $\begin{pmatrix} 5 \\ k \end{pmatrix}$

17. 0607_w17_ms_41 Q: 13

Question	Answer	Marks	Partial Marks
(a)(i)	$\mathbf{c - a}$ oe	1	
(a)(ii)	$\frac{2}{3}\mathbf{a} + \frac{1}{3}\mathbf{c}$ or $\frac{1}{3}(2\mathbf{a} + \mathbf{c})$	2	B1 for correct unsimplified or correct route e.g. $\mathbf{c} + \frac{2}{3}\overline{CA}$ or $\mathbf{a} + \frac{1}{3}$ <i>their</i> (i)
(a)(iii)	$2\mathbf{a}$	2	B1 for correct unsimplified or correct route e.g. $-\mathbf{c} + 3 \times$ <i>their</i> (ii)
(b)	Collinear oe	1	

18. 0607_w17_ms_43 Q: 5

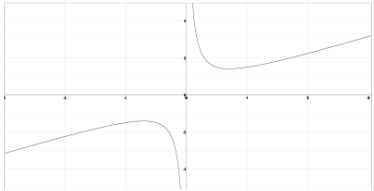
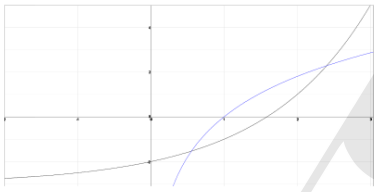
Question	Answer	Marks	Partial Marks
(a)(i)	$-6\mathbf{p} + 6\mathbf{q}$ oe	1	
(a)(ii)	$-2\mathbf{p} + 2\mathbf{q}$ oe	2	FT <i>their</i> (a)(i) $\div 3$ provided in form $\mathbf{ap} + \mathbf{bq}$ B1 for $-2\mathbf{p} + \mathbf{kq}$ or for $\mathbf{kp} + 2\mathbf{q}$ M1 for $\overline{AD} = 2\mathbf{p}$ oe or $\overline{AE} = 2\mathbf{q}$ or correct route
(a)(iii)	$4\mathbf{p}$ cao	1	
(a)(iv)	$-6\mathbf{p} + 2\mathbf{q}$ oe	2	B1 for $-6\mathbf{p} + \mathbf{kq}$ or for $\mathbf{kp} + 2\mathbf{q}$ M1 for a correct route
(b)(i)	216	2	M1 for $\left(\frac{1}{3}\right)^2$ or 3^2 oe soi
(b)(ii)	96	3	M2 for $\left(\frac{1}{2}\right)^2$ or 2^2 oe soi or M1 for triangle <i>EFC</i> is similar to triangle <i>EDA</i> soi

19. 0607_s16_ms_43 Q: 8

Question	Answer	Mark	Part Marks
(a)	$6\mathbf{p} - \mathbf{q}$	2	B1 for $\overline{XD} = -\mathbf{q}$ or M1 for $\overline{AD} = \overline{AX} + \overline{XD}$ oe
(b)	$3\mathbf{p} + \mathbf{q}$ oe	2	M1 for $\overline{AC} = 9\mathbf{p}$ or $\overline{XC} = 3\mathbf{p}$ or correct route
(c)	$3\mathbf{p} - 2\mathbf{q}$ oe	3	M1 for $\overline{BD} =$ <i>their</i> (a) M1 for $\overline{CB} = \overline{CD} + \overline{DB}$ oe

Question	Answer	Marks	Partial Marks
(a)(i)	$\begin{pmatrix} 5 \\ 9 \end{pmatrix}$	2	B1 for $\begin{pmatrix} 5 \\ k \end{pmatrix}$ or $\begin{pmatrix} k \\ 9 \end{pmatrix}$ or M1 for $\begin{pmatrix} 3 \\ 5 \end{pmatrix} - \begin{pmatrix} -2 \\ -4 \end{pmatrix}$ or $\begin{pmatrix} 3 \\ 5 \end{pmatrix} + \begin{pmatrix} 2 \\ 4 \end{pmatrix}$
(a)(ii)	$\begin{pmatrix} 1 \\ -2 \end{pmatrix}$	2	B1 for $\begin{pmatrix} 1 \\ k \end{pmatrix}$ or $\begin{pmatrix} k \\ -2 \end{pmatrix}$ If 0 scored SC1 for answer $\begin{pmatrix} -1 \\ 2 \end{pmatrix}$
(a)(iii)	(4, 5)	1	
(a)(iv)	5	2	M1 for $(-3)^2 + (-4)^2$ oe
(b)(i)	$y = 2x + 3$ oe	5	B4 for answer $2x + 3$ OR M1 for $\text{grad} = \frac{6-4}{-1-3}$ oe or better M1 for perp $\text{grad} = \frac{-1}{\text{their gradient}}$ B1 for (1, 5) M1 for substituting <i>their</i> (1, 5) into $y = (\text{their } m)x + c$ oe
(b)(ii)	(-1.5, 0)	2	FT <i>their</i> (b)(i) M1 for $y = 0$ substituted in <i>their</i> equation in (b)(i)

21. 0607_w18_ms_43 Q: 4

Question	Answer	Marks	Partial Marks
(a)(i)	Correct sketch 	3	B2 for correct shaped branches but branches joined or B1 for one branch correct shape (even if branches connected)
(a)(ii)	(0.707 or 0.7071..., 1.41 or 1.414...)	2	B1 for (0.707 or 0.7071..., k) or for (k , 1.41 or 1.414...)
(a)(iii)	$f(x) \geq 1.41$ or 1.414...	1	FT <i>their</i> (ii)
(a)(iv)	$x = 0$ $y = x$ oe	2	B1 for each
(b)(i)(a)	Correct sketches 	2	B1 for increasing exponential graph with negative y -intercept.
(b)(i)(b)		2	B1 for correct shape all to right of y -axis and x -intercept not too far from 1.
(b)(ii)	0.556 or 0.5559... < x < 2.4[0] or 2.401...	2	B1 for both correct values seen

22. 0607_s17_ms_42 Q: 4

Question	Answer	Marks	Partial Marks
(a)(i)	$\begin{pmatrix} -1.5 \\ 1 \end{pmatrix}$ oe	1	
(a)(ii)	$\begin{pmatrix} 10 \\ -1 \end{pmatrix}$	2	B1 for each
(a)(iii)	$\sqrt{13}$ final answer	2	M1 for $(-3)^2 + 2^2$ oe soi by 3.61 or 3.605 to 3.606 $\sqrt{13}$ in working implies M1
(b)	Correct B clearly indicated	2	B1 for vector $\begin{pmatrix} 1 \\ 5 \end{pmatrix}$ drawn not from A or $\begin{pmatrix} 1 \\ 5 \end{pmatrix}$ seen or correctly following through, from A , their incorrect vector seen. or either $\begin{pmatrix} -3 \\ 2 \end{pmatrix}$ or $\begin{pmatrix} 4 \\ 3 \end{pmatrix}$ correctly drawn only if one starts from A .

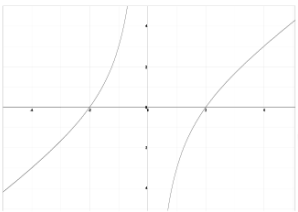
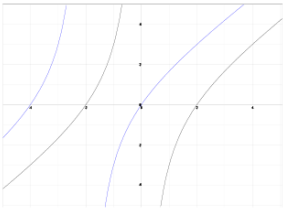
23. 0607_m21_ms_42 Q: 1

Question	Answer	Marks	Partial Marks
(a)(i)	correct triangle B (0, 3) (0, 8) (-3, 3)	2	B1 for 90° rotation about wrong centre
(a)(ii)	correct triangle C (-3, 0) (-8, 0) (-3, 3)	1	
(a)(iii)	reflection $x + y = 0$ oe	2	B1 for each
(b)	enlargement [scale factor] 3 [centre] (0, 0) oe	3	B1 for each

24. 0607_s21_ms_41 Q: 2

Question	Answer	Marks	Partial Marks
(a)	Correct triangle (-8, -1) (-7, -1) (-8, 3)	2	B1 for correct translation in y or for correct translation in x
(b)	Translation $\begin{pmatrix} 3 \\ 5 \end{pmatrix}$	2	B1 for each
(c)	Correct triangle (4, 4) (4, 5) (8, 5)	2	M1 for correct rotation, wrong centre or for rotation anticlockwise 90° , about O
(d)	Correct triangle (4, -4) (4, -5) (8, -5)	2	M1 for correct orientation, incorrect position or for reflection in $y = -x$
(e)	Reflection $y = 0$ oe	2	B1 for each

25. 0607_s21_ms_43 Q: 1

Question	Answer	Marks	Partial Marks
(a)	Correct sketch 	2	B1 for each branch or B1 for correct but branches joined
(b)	-2, 2	2	B1 for each
(c)	-1.24 or -1.236... 3.24 or 3.236...	2	B1 for each
(d)(i)	Correct sketch 	2	B1 for each branch or B1 FT their $f(x)$ translated in x direction
(d)(ii)	Translation $\begin{pmatrix} -2 \\ 0 \end{pmatrix}$	2	B1 for each

Question	Answer	Marks	Partial Marks										
(a)(i)	<table border="1"> <tr><td>Rotation</td><td>✓</td></tr> <tr><td>Reflection</td><td>✓</td></tr> <tr><td>Translation</td><td>✓</td></tr> <tr><td>Enlargement</td><td></td></tr> <tr><td>Stretch</td><td></td></tr> </table>	Rotation	✓	Reflection	✓	Translation	✓	Enlargement		Stretch		1	
Rotation	✓												
Reflection	✓												
Translation	✓												
Enlargement													
Stretch													
(a)(ii)	<table border="1"> <tr><td>Rotation</td><td>✓</td></tr> <tr><td>Reflection</td><td>✓</td></tr> <tr><td>Translation</td><td>✓</td></tr> <tr><td>Enlargement</td><td>✓</td></tr> <tr><td>Stretch</td><td></td></tr> </table>	Rotation	✓	Reflection	✓	Translation	✓	Enlargement	✓	Stretch		1	
Rotation	✓												
Reflection	✓												
Translation	✓												
Enlargement	✓												
Stretch													
(a)(iii)	<table border="1"> <tr><td>Rotation</td><td></td></tr> <tr><td>Reflection</td><td></td></tr> <tr><td>Translation</td><td></td></tr> <tr><td>Enlargement</td><td>✓</td></tr> <tr><td>Stretch</td><td>✓</td></tr> </table>	Rotation		Reflection		Translation		Enlargement	✓	Stretch	✓	1	
Rotation													
Reflection													
Translation													
Enlargement	✓												
Stretch	✓												

Question	Answer	Marks	Partial Marks
(b)(i)	Rotation 90 [anticlockwise] oe (0, 0) oe	3	B1 for each
(b)(ii)	Triangle with vertices at (2, -4), (4, -4), (4, 4)	2	B1 for stretch, factor 2, y-axis invariant, or stretch, factor 2, $y = c$ invariant

27. 0607_w21_ms_42 Q: 5

Question	Answer	Marks	Partial Marks
(a)(i)	Image at $(-2, 1)$, $(-5, 1)$, $(-5, 2)$	1	
(a)(ii)	Image at $(-8, 6)$, $(-5, 6)$, $(-5, 7)$	2	B1 for translation $\begin{pmatrix} -10 \\ k \end{pmatrix}$ or $\begin{pmatrix} k \\ 5 \end{pmatrix}$
(a)(iii)	Image at $(3, 0)$, $(3, -3)$, $(4, -3)$	2	B1 for rotation 90° anticlockwise about $(2, 0)$ or rotation 90° clockwise but incorrect centre.
(a)(iv)	Image at $(-4, -2)$, $(-10, -2)$, $(-10, -4)$	2	B1 for enlargement factor -2 correct orientation but incorrect position
(a)(v)	Stretch [factor] 3 x -axis oe invariant	3	B1 for each
(b)(i)	$x^2 + 2$	1	
(b)(ii)	$2x^2$	1	

28. 0607_s20_ms_41 Q: 1

Question	Answer	Marks	Partial Marks
(a)(i)	Image at $(-1, 1)$, $(-3, 1)$, $(-3, 2)$	1	
(a)(ii)	Image at $(-4, 4)$, $(-2, 4)$, $(-2, 5)$	2	B1 for translation $\begin{pmatrix} -5 \\ k \end{pmatrix}$ or $\begin{pmatrix} k \\ 3 \end{pmatrix}$
(a)(iii)	Image at $(0, 2)$, $(4, 2)$, $(4, 4)$	2	B1 for enlargement factor 2, different centre
(b)(i)	Rotation $(-2, 0)$ 90° clockwise oe	3	B1 for each
(b)(ii)	Stretch -2 x -axis oe invariant	3	B1 for each

29. 0607_s20_ms_42 Q: 2

Question	Answer	Marks	Partial Marks
(a)(i)	Translation $\begin{pmatrix} -6 \\ -10 \end{pmatrix}$	2	B1 for each
(a)(ii)	Enlargement SF 2 Centre (0, 9)	3	B1 for each
(b)(i)	(-2, -5)	1	
(b)(ii)	(2, -5)	1	
(b)(iii)	Reflection x-axis oe	2	B1 for each
(b)(iv)	Reflection y-axis oe	2	B1 for each

30. 0607_w20_ms_42 Q: 7

Question	Answer	Marks	Partial Marks
(a)	6.71 or 6.708...	3	M2 for $(9 - 3)^2 + (5 - 2)^2$ soi or M1 for $9 - 3$ and $5 - 2$ soi
(b)	$[y =] 0.5x + 0.5$ oe	3	M1 for gradient = $\frac{5-2}{9-3}$ oe M1 for substituting (3, 2) or (9, 5) into their $y = mx + c$ oe
(c)	$[y =] -2x + 18$	3	M1 for gradient = $-1 \div$ their 0.5 M1 for substituting (8, 2) into their $y = mx + c$ oe
(d)	(7, 4)	2	B1 for each coordinate or M1 for their (b) = their (c)
(e)(i)	(6, 6)	2	B1 for each coordinate
(e)(ii)	Kite	1	

Question	Answer	Marks	Partial Marks
(f)	15 or 14.99 to 15.01	3	<p>M2 for $\frac{(8-3) \times (5-2)}{2} \times 2$</p> <p>OR</p> <p>M1 for $((\text{their } 6) - 8)^2 + ((\text{their } 6) - 2)^2$</p> <p>M1 for $0.5 \times \text{their (a)} \times \text{their CD}$</p> <p>OR</p> <p>M2 for $24 - 6 - 2 \times 1.5$ oe or better or M1 for $6 \times 4 - 0.5 \times 3 \times 4 - 2 \times 0.5 \times 1 \times 3$</p>

31. 0607_w20_ms_43 Q: 9

Question	Answer	Marks	Partial Marks
(a)	$\begin{pmatrix} -3 \\ 4 \end{pmatrix}$	1	
(b)	(2, 7)	1	
(c)	(1, 5)	1	
(d)	(1.5, 6)	1	FT <i>their (b)</i> and <i>(c)</i> .
(e)	2.24 or 2.236...	3	<p>FT <i>their (b)</i> and <i>(c)</i>.</p> <p>M2 for $(\text{their } 2 - \text{their } 1)^2 + (\text{their } 7 - \text{their } 5)^2$ oe or M1 for $(\text{their } 2 - \text{their } 1)$ and $(\text{their } 7 - \text{their } 5)$ seen</p>
(f)	$y = 2x - 2$ oe	3	<p>M1 for gradient = $-\frac{1}{2}$ oe soi 2</p> <p>M1 for substituting (3, 4) in $y = \text{their } m x + c$ Answer $2x - 2$ implies M1 M1</p>

32. 0607_w20_ms_43 Q: 10

Question	Answer	Marks	Partial Marks
(a)(i)	Rotation 90 [anticlockwise] oe (0, 0) oe	3	B1 for each
(a)(ii)	Image at (1, -5), (2, -6), (4, -6), (4, -5)	2	B1 for reflection in $y = k$
(a)(iii)	Image at (1, 2), (2, 4), (4, 2), (4, 4)	2	B1 for other stretch, factor 2, $y = k$ invariant or y -axis invariant
(b)	Stretch [factor] 3 x -axis oe invariant	3	B1 for each If 0 scored M1 for $[g(x)] = 3 \log x$

33. 0607_s19_ms_41 Q: 2

Question	Answer	Marks	Partial Marks
(a)	Reflection $y = -1$	2	B1 for each
(b)	Triangle at (6, -3), (11, -3), (10, -1)	2	B1 for translation $\begin{pmatrix} k \\ -3 \end{pmatrix}$ or $\begin{pmatrix} 6 \\ k \end{pmatrix}$
(c)(i)	63.4 or 63.43 to 63.44	3	B2 for $\tan [\theta] = \frac{4}{2}$ oe or B1 for correct angle clearly identified and no other angle seen.
(c)(ii)	5	3	M2 for $\frac{\sqrt{125}}{5}$ or $\frac{10}{\sqrt{20}}$ or $\frac{5}{\sqrt{5}}$ or M1 for $\sqrt{10^2 + 5^2}$ or $\sqrt{4^2 + 2^2}$ or $\sqrt{1^2 + 2^2}$ or $\sqrt{125}$ or $\sqrt{20}$ or $\sqrt{5}$

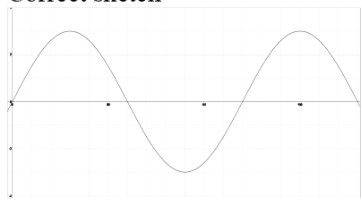
34. 0607_s19_ms_42 Q: 6

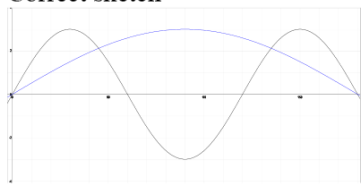
Question	Answer	Marks	Partial Marks
(a)	Correct reflection at $(1, -1)$, $(4, -1)$, $(4, -3)$, $(3, -3)$	1	
(b)	Correct translation at $(5, -4)$, $(2, -4)$, $(2, -6)$, $(3, -6)$	2	B1 for translation $\begin{pmatrix} 6 \\ k \end{pmatrix}$ or $\begin{pmatrix} k \\ -3 \end{pmatrix}$
(c)	Rotation 90° clockwise oe $(0, 1)$	3	B1 for each
(d)	Correct stretch at $(-1, -2)$, $(-4, -2)$, $(-4, -6)$, $(-3, -6)$	2	B1 for stretch factor 2 displaced vertically

35. 0607_w19_ms_41 Q: 4

Question	Answer	Marks	Partial Marks
(a)(i)	Translation $\begin{pmatrix} -1 \\ 6 \end{pmatrix}$	2	B1 for each
(a)(ii)	Rotation [centre] $(2, 1)$ 90° clockwise oe	3	B1 for each
(a)(iii)	Enlargement [centre] $(3, 0)$ [factor] 3	3	B1 for each
(b)	Correct stretch at $(4, 1)$ $(10, 1)$, $(10, 3)$	2	B1 for stretch factor 2 with x -axis invariant or for stretch with $x = k$ invariant with stretch factor 2

36. 0607_w19_ms_41 Q: 11

Question	Answer	Marks	Partial Marks
(a)	Correct sketch 	2	B1 for sine graph with incorrect amplitude and/or incorrect period, passing through $(0, 0)$.
(b)	3 120	2	B1 for each
(c)	$70 < x < 110$	2	B1 for 70 and 110 seen

Question	Answer	Marks	Partial Marks
(d)(i)	Correct sketch 	1	
(d)(ii)	Two areas shaded, which are below graph of $y = f(x)$ and above graph of $y = g(x)$	1	
(d)(iii)	Stretch [factor] $\frac{1}{3}$ invariant line y -axis oe	3	B1 for each

37. 0607_w19_ms_42 Q: 1

Question	Answer	Marks	Partial Marks
(a)	Correct triangle with vertices (3, -5), (5, -5), (5, -4)	1	
(b)	Correct triangle with vertices (3, 2), (5, 2), (5, 1)	1	
(c)	Reflection $y = -1.5$ oe	2	B1 for each
(d)	Correct triangle with vertices (-5, 3), (-5, 5), (-4, 5)	2	B1 for correct rotation with incorrect centre of rotation. or B1 for clockwise rotation with correct centre of rotation.
(e)	Reflection $y = x$ oe	2	B1 for each

Paper Perfection, Crafted With Passion

38. 0607_w19_ms_43 Q: 5

Question	Answer	Marks	Partial Marks
(a)	Triangle at (2, 0), (2, -4), (4, -4)	2	B1 for reflection in $y = k$ or $x = 1$
(b)	Triangle at (0, 2), (-2, 2), (-2, 3)	3	B2 for Rotation 90° anti-clockwise about (1, 0) or B1 for Rotation 90° clockwise about any centre.
(c)	Enlargement [Scale factor] $-\frac{1}{2}$ oe [Centre] (0, 0) oe	3	B1 for each
(d)	Stretch [Stretch factor] 3 Invariant [line] y -axis oe	3	B1 for each

39. 0607_s18_ms_41 Q: 1

Question	Answer	Marks	Partial Marks
(a)(i)	Translation $\begin{pmatrix} 1 \\ 7 \end{pmatrix}$	2	B1 for each
(a)(ii)	Reflection $x = -\frac{1}{2}$ oe	2	B1 for each
(b)	Triangle drawn at (3, 2), (3, 4), (-3, 2)	2	B1 for enlargement factor 2 with wrong centre, or correct centre with wrong positive factor (not 1)
(c)	Triangle drawn at (2, 1), (8, 1), (8, 2)	2	B1 for stretch factor 2 with x -axis invariant. or stretch factor 2 translated horizontally

40. 0607_s18_ms_42 Q: 6

Question	Answer	Marks	Partial Marks
(a)	Correct triangle. (-6, -1), (-4, -1), (-6, 3)	2	B1 for $\begin{pmatrix} -7 \\ k \end{pmatrix}$ or $\begin{pmatrix} k \\ -3 \end{pmatrix}$

Question	Answer	Marks	Partial Marks
(b)	Correct triangle. (-1, 4), (-1, 6), (-5, 4)	2	B1 for correct rotation about any centre or for correct centre but 90° clockwise
(c)	Rotation 90° clockwise oe [Centre] (-6, 4)	3	B1 for each
(d)	Correct triangle. (3, -1), (7, -1), (7, -9)	2	B1 for correct enlargement with wrong centre
(e)	Enlargement [centre] (3, 1) [SF] -0.5	2	B1 for each

41. 0607_s18_ms_43 Q: 3

Question	Answer	Marks	Partial Marks
(a)	Triangle at (4, -4), (5, -4), (5, -6)	2	B1 for translation $\begin{pmatrix} 3 \\ k \end{pmatrix}$ or $\begin{pmatrix} k \\ -1 \end{pmatrix}$
(b)	Triangle at (5, 0), (7, 0), (7, 3)	2	B1 for any stretch in with x -axis invariant or correct stretch translated vertically
(c)	Rotation 90° clockwise oe (3, -1)	3	B1 for each

42. 0607_w18_ms_41 Q: 6

Question	Answer	Marks	Partial Marks
(a)	Vertices (-5, 3) (-8, 3) (-8, 5)	2	B1 for reflection in $x = k$, $k \neq -2$ or B1 for reflection in $y = -2$
(b)	Vertices (-5, -5) (-8, -5) (-8, -7)	2	B1 for correct rotation with incorrect centre of rotation.
(c)	Reflection $y = -1$ cao	2	B1 for each
(d)	Vertices (1, 4) (7, 4) (7, 8)	2	M1 for enlargement SF2 different centre or for enlargement different SF, correct centre

43. 0607_w18_ms_42 Q: 3

Question	Answer	Marks	Partial Marks
(a)	Triangle at $(-5, 3), (-1, 3), (-1, 5)$	2	B1 translation $\begin{pmatrix} -5 \\ k \end{pmatrix}$ or $\begin{pmatrix} k \\ 3 \end{pmatrix}$
(b)	Enlargement [Scale factor] $-\frac{1}{2}$ [Centre] $(6, 4)$	3	B1 for each
(c)	Rotation 90° clockwise oe $(0, 0)$	3	B1 for each

44. 0607_w18_ms_42 Q: 14

Question	Answer	Marks	Partial Marks
(a)	10	3	M2 for $\sqrt{6^2 + 8^2}$ or B1 for 6 and 8 seen nfw
(b)	$(4, 5)$	2	B1 for each co-ordinate
(c)	$y = \frac{3}{4}x + 2$ oe	4	Must be 3 term equation B2 for gradient = $\frac{3}{4}$ or B1 for gradient of $AB = -\frac{4}{3}$ M1 for substituting <i>their (b)</i> into $y = (\text{their } m)x + c$ oe

45. 0607_w18_ms_43 Q: 2

Question	Answer	Marks	Partial Marks
(a)	Rotation 90° clockwise oe $(5, 1)$	3	B1 for each
(b)	Correct reflection $(-1, 1), (-4, 1), (-4, 3)$	1	
(c)	Correct translation $(6, 7), (9, 7), (9, 9)$	2	B1 for translation $\begin{pmatrix} 5 \\ k \end{pmatrix}$ or $\begin{pmatrix} k \\ 6 \end{pmatrix}$
(d)	Correct stretch $(1, 3), (4, 3), (4, 9)$	2	B1 for stretch factor 3 displaced vertically or stretch with x -axis invariant but other factor.

46. 0607_s17_ms_41 Q: 4

Question	Answer	Marks	Partial Marks
(a)	Correct triangle (2, 1) (3, 1) (2, 4)	2	B1 for translation $\begin{pmatrix} k \\ -4 \end{pmatrix}$ or $\begin{pmatrix} 0 \\ k \end{pmatrix}$
(b)	Correct triangle (-5, 2) (-5, 3) (-8, 2)	2	B1 for correct rotation, incorrect centre or for rotation 90° clockwise, correct centre
(c)	Rotation [Centre] (0, 0) 90° clockwise oe	2	B1 for each
(d)	Correct triangle (-5, -2) (-5, -3) (-8, -2)	3	B1 for $y = -x$ soi M1 for correct shape, incorrect location
(e)	Reflection x -axis oe	2	B1 for each

47. 0607_s17_ms_42 Q: 2

Question	Answer	Marks	Partial Marks
(a)(i)	Reflection, $y = x$	1	
(a)(ii)	Enlargement [with centre] (2, 1) [scale factor] $\frac{1}{4}$ oe	2	B1 for each
(a)(iii)	Translation $\begin{pmatrix} 3 \\ -5 \end{pmatrix}$	2	B1 for each
(b)(i)	Correct triangle (0, 0), (0, 2), (-2, 3)	2	SC1 for rotation 90° clockwise about (0, 0) or rotation 90° anti-clockwise about different centre
(b)(ii)	Correct triangle (0, 0), (4, 0), (6, 2)	2	SC1 for stretch with s.f. = 2, x -axis invariant or stretch with y -axis invariant with different scale factor.

48. 0607_s17_ms_42 Q: 12

Question	Answer	Marks	Partial Marks
(a)	11	1	
(b)	6	2	B1 for $h(2) = 1$ soi or $4(x^2 - 3) + 2$ or better
(c)	-3	2	M1 for $4x = -10 - 2$
(d)	$h(x) \geq -3$	1	Allow $y \geq -3$
(e)	$\frac{x-2}{4}$ oe final answer	2	M1 for $y - 2 = 4x$ or $x = 4y + 2$ or $\frac{y}{4} = x + \frac{2}{4}$
(f)	Stretch x-axis invariant [Scale factor] 2 OR Reflection $y = -2.70 + 6.75$ OR Rotation (2.5, 0) 167 (167.47) or 12.5 (12.53) clockwise	3 M1 A2 M1 A1 A1	B1 for each
(g)	$[y =]x^2 - 4x + 1$	3	M2 for $y = (x - 2)^2 - 3$ or M1 for $x - 2$ seen in a quadratic If 0 scored, SC1 for $y = x^2 + 4x + 1$

49. 0607_s17_ms_43 Q: 1

Question	Answer	Marks	Part Marks
(a)	Image at (0, 5), (3, 5), (3, 3)	2	SC1 for translation $\begin{pmatrix} -2 \\ k \end{pmatrix}$ or $\begin{pmatrix} k \\ 7 \end{pmatrix}$
(b)(i)	Image at (2, 2), (5, 2), (5, 4)	1	
(b)(ii)	Image at (-4, -2), (-7, -2), (-7, -4)	1	
(b)(iii)	Rotation 180 [centre] (-1, 0)	3	B1 for each
(c)	Stretch [factor]2 x-axis oe invariant	3	B1 for each

50. 0607_w17_ms_42 Q: 3

Question	Answer	Marks	Partial Marks
(a)(i)	Image at (2, 4), (3, 6), (6, 6), (6, 4)	2	SC1 for reflection in other horizontal line or in the line $x = 1$
(a)(ii)	Image at (-4, -2), (-6, -3), (-6, -6), (-4, -6)	2	SC1 for correct orientation but wrong centre
(a)(iii)	Reflection $y = -x$ oe	2	B1 for each
(b)	Enlargement [centre] (0, 0) oe [factor] -0.5 oe	3	B1 for each
(c)	Image at (2, -4), (6, -4), (6, -8), (3, -8)	2	SC1 for stretch with x -axis invariant with other factor or stretch with $y = k$ invariant with stretch factor 2

51. 0607_w17_ms_42 Q: 11

Question	Answer	Marks	Partial Marks
(a)(i)	10	1	
(a)(ii)	1	1	
(b)	$\frac{x-1}{2}$ oe	2	M1 for $y - 1 = 2x$ or $x = 2y + 1$ or $\frac{y}{2} = x + \frac{1}{2}$
(c)	$4x^2 + 4x + 2$ final answer	3	M1 for $(2x+1)^2 + 1$ B1 for $[(2x+1)^2 =] 4x^2 + 2x + 2x + 1$ oe
(d)	Translation $\begin{pmatrix} 0 \\ -2 \end{pmatrix}$	2	B1 for each
(e)	3	1	

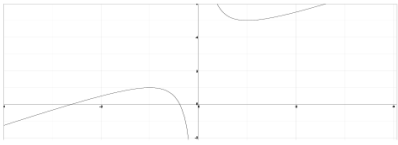
52. 0607_s16_ms_42 Q: 1

Question	Answer	Mark	Part Marks
(a)	Image at (5, 5), (7, 5), (6, 6), (5, 6)	2	If 0 scored SC1 for translation $\begin{pmatrix} 3 \\ k \end{pmatrix}$ or $\begin{pmatrix} k \\ 4 \end{pmatrix}$
(b)	Image at (-1, -2), (-1, -4), (-2, -3), (-2, -2)	2	If 0 scored SC1 for reflection in line $y = x$
(c)	Image at (-2, 5), (-2, 7), (-3, 5), (-3, 6)	3	If 0 scored SC2 for 90° clockwise about (-2, 1) or SC1 for 90° anticlockwise about other centre
(d) (i)	Enlargement [scale factor] 3 [centre] (2, 4)	B1 B1 B1	If combined transformations, all three marks lost
(ii)	Stretch [factor] 2 y -axis oe invariant	B1 B1 B1	If combined transformations, all three marks lost

53. 0607_w16_ms_41 Q: 2

Qu.	Answer	Mark	Part Marks
(a) (i)	$\begin{pmatrix} -8 \\ -5 \end{pmatrix}$	1	
(ii)	Image at (-4, -1), (2, -1), (2, 3)	2FT	SC1FT for translation $\begin{pmatrix} -8 \\ k \end{pmatrix}$ or $\begin{pmatrix} k \\ -5 \end{pmatrix}$
(iii)	9.43 or 9.433 to 9.434	2	M1 for $(their(-8))^2 + (their(-5))^2$ oe
(b) (i)	Reflection y -axis oe	1 1	
(ii)	Enlargement 0.5 oe (10, -10)	1 1 1	
(iii)	Stretch [factor] 0.25 oe x -axis oe invariant	1 1 1	

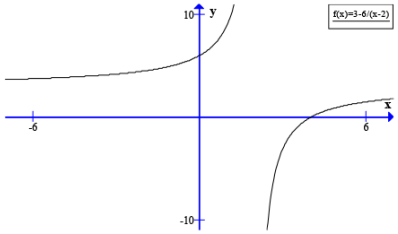
54. 0607_w16_ms_41 Q: 8

Qu.	Answer	Mark	Part Marks
(a)	Correct sketch 	2	B1 for one correct branch
(b)	-2.62 or -2.618... -0.382 or -0.3820 to -0.3819	1 1	If 0 scored, M1 for correct use of quadratic formula oe
(c)	$x < -2.62$ $-0.382 < x < 0$	1FT 2FT	FT only if 2 negative roots in (b) FT only if 2 negative roots in (b) B1 each
(d)	[a=] 0 [b=] 3	1 1	
(e)	Translation $\begin{pmatrix} 0 \\ -3 \end{pmatrix}$ oe	1 1	

55. 0607_w16_ms_42 Q: 6

Question	Answer	Mark	Part Marks
(a)	Reflection $y = x$	2	B1 for each
(b)	Rotation, centre (2, 3) 90 [anticlockwise] or 270 clockwise	2	B1 for each
(c)	Translation $\begin{pmatrix} -4 \\ 3 \end{pmatrix}$	2	B1 for each
(d)	Enlargement, centre (0, 0) [SF] $\frac{1}{3}$ oe	2	Allow reduction B1 for each

56. 0607_w16_ms_42 Q: 10

Question	Answer	Mark	Part Marks
(a)	Fully correct curve 	3	B2 for both branches but with serious 'curl back' and/or overlap. or B1 for 1 branch
(b)	$x = 2$ $y = 3$	2	B1 for each
(c)	$[x =] -4$ $[x =] 3$	2	B1 for each
(d)	$x < -4$ $2 < x < 3$	1 2	FT <i>their</i> -4 from (c) FT <i>their</i> 2 from (b) and <i>their</i> 3 from (c) B1 for each
(e) (i)	Translation $\begin{pmatrix} 2 \\ 0 \end{pmatrix}$	2	B1 for each
(ii)	Translation $\begin{pmatrix} 0 \\ 3 \end{pmatrix}$	2	B1 for each

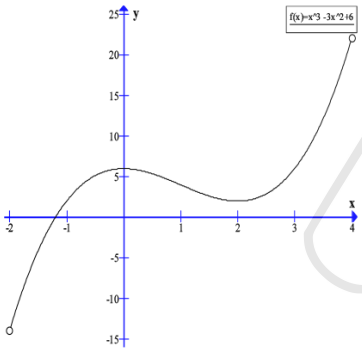
57. 0607_w16_ms_43 Q: 3

Question	Answer	Mark	Part Marks
(a)	Reflection $x = -2$	1 1	In all three parts of (a) give 0 for any indication of second transformation.
(b)	Rotation 90° [anticlockwise] oe $(5, 1)$	1 1 1	
(c)	Stretch x -axis oe invariant [stretch factor] 3	1 1 1	

58. 0607_s15_ms_41 Q: 4

Qu.	Answer	Mark	Part Marks
(a)	Reflection $x = -1$ oe	1 1	Any combination of transformations scores 0
(b)	$(-1, 4), (-1, 2), (0, 2)$	3	M2 for any rotation 90° clockwise If 0 scored, SC2 for rotation 90° anti-clockwise about $(-1, 6)$ or SC1 for any rotation 90° anti-clockwise
(c)	Reflection $y = x + 7$ oe	1 1FT	Any combination of transformations scores 0 FT if SC2 scored in (b) to $y = -x + 5$


59. 0607_s15_ms_42 Q: 4

Qu.	Answer	Mark	Part Marks
(a)	Good curve with x intercept reasonably placed and maximum reasonably placed on y -axis and minimum in 1st quadrant 	2	B1 for basic cubic shape (max before min)
(b)	$(0, 6)$ $(2, 2)$	1 1	SC1 if answers reversed
(c)	$2 < k < 6$	2FT	FT their y values from (b) SC1 for $2 \leq k \leq 6$ or for $2 < k < n$ or $n < k < 6$ or for $2 < k \leq 6$ or $n \leq k < 6$ or for $2 < x < 6$
(d)	Rotational [Order] 2 [About] $(1, 4)$	1 1 1	
(e)	$x^3 - 3x^2 + 4$ or $(x - 2)(x - 2)(x + 1)$	1	

60. 0607_w15_ms_41 Q: 2

Question	Answer	Mark	Part Marks
(a) (i)	$\begin{pmatrix} 46 \\ 30 \end{pmatrix}$	2	B1 each component SC1 for $\begin{pmatrix} 46 \\ 30 \end{pmatrix}$
(ii)	13	3	M2 for $\sqrt{12^2 + 5^2}$ or M1 14 – 2 and 8 – 3 or better seen
(b)	$[u =] -2$ $[v =] 0$	1 1	
(c) (i)	Image at (1, –3), (1, –6), (2, –6)	3	SC2 for rotation about (–1, –1) 90° anti-clockwise or SC1 for rotation 90° clockwise with different centre
(ii)	Reflection $x = -1$	1 1	
(iii)	Stretch [factor] 4 invariant x -axis oe	1 1 1	

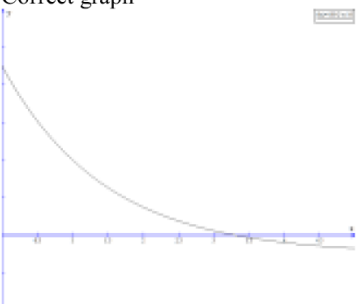
61. 0607_w15_ms_41 Q: 3

Question	Answer	Mark	Part Marks
(a),(d)		2 2	M1 for inaccurate rectangular hyperbola but with correct orientation. M1 for inaccurate rectangular hyperbola but with correct orientation.
(b)	$0 < x < 2$ oe	2	B1 for $0 < x$ oe or $x < 2$ oe
(c)	$\frac{2}{1-x}$ oe	3	M1 for correct and appropriate rearrangement M1 for correct multiplication M1 for correct changing x and y M1 for correct division If answer incorrect maximum possible is M2
(e)	Reflection $y = x$	1 1	

62. 0607_w15_ms_42 Q: 4

Question	Answer	Mark	Part Marks
(a) (i)	Reflection in x -axis	1	B1 for rotation
(ii)	Rotation 90° [anticlockwise] [about] origin oe	2	
(b)	Reflection $y = -x$	1 1	

63. 0607_w15_ms_42 Q: 13

Question	Answer	Mark	Part Marks
(a) (i)	Correct graph 	2	M1 for graph with correct shape.
(ii)	3.32 or 3.321 to 3.322	1	
(iii)	$[f(x)] > -10$	1	Ignore ≤ 90
(b)	1.74 or 1.736 to 1.737	1	
(c)	Translate $\begin{pmatrix} 0 \\ -10 \end{pmatrix}$	1 1	

Paper Perfection, Crafted With Passion

64. 0607_w15_ms_43 Q: 11

Question	Answer	Mark	Part Marks
(a)	8	1	
(b)	2, 1	1	
(c)	-6 and 2	4	B3 for $(x-6)(x+2)$ or SC3 for 6 and -2 or B2 for $x^2 - 2x - 2x + 4 - 16$ or better or M1 for $(x-2)^2 - 16$ or for $x^2 + ax + bx + ab$
(d) (i)	$\frac{2-x}{x}$ oe final answer	3	M1 for interchanging x and y M1 for a correct multiplication M1 for a correct rearrangement and a correct division If answer incorrect maximum possible is M2
(ii)	$\log_2 x$ or $\frac{\log x}{\log 2}$	2	M1 for $\log y = x \log 2$ or $\log_2 y = x$ oe or $x = 2^y$
(e)	Stretch [factor] 2 and x -axis invariant	1 1	

65. 0607_s20_ms_43 Q: 5

Question	Answer	Marks	Partial Marks
(a)(i)	Reflection in the line $y = 3$	1	
(a)(ii)	Translation $\begin{pmatrix} -5 \\ 4 \end{pmatrix}$	2	B1 for each
(a)(iii)	Enlargement [centre] (2, -1) [scale factor] $\frac{1}{3}$	2	B1 for each
(b)(i)	Triangle at (-6, 0), (-2, 0), (-2, -2)	2	B1 for rotation 90° clockwise about (-1, 0) or 90° anticlockwise about another centre
(b)(ii)	Triangle at (2, 2), (2, 4), (3, 4)	2	B1 for enlargement scale factor $-\frac{1}{2}$, wrong centre or scale factor $\frac{1}{2}$, centre (1, 3)
(b)(iii)	Stretch [Stretch factor] 3 Invariant line y-axis oe	3	B1 for each

66. 0607_w20_ms_41 Q: 4

Question	Answer	Marks	Partial Marks
(a)(i)	Rotation, [Centre] (0, 0) [Anticlockwise] 90° or clockwise 270°	3	B1 for each
(a)(ii)	Enlargement [Scale factor] 2 [Centre] (-1, -1)	3	B1 for each
(a)(iii)	Correct triangle (2, 1) (6, 1) (6, 2)	2	B1 for correct stretch with x-axis invariant or B1 for correct SF in wrong position
(b)(i)	Reflect $y = 2$	1	
(b)(ii)	Translation $\begin{pmatrix} 5 \\ -2 \end{pmatrix}$	2	B1 for each

67. 0607_s21_ms_42 Q: 2

Question	Answer	Marks	Partial Marks
(a)(i)	Triangle at $(-2, 4)$, $(0, 4)$, $(0, 5)$	2	B1 for rotation 90° clockwise about $(-1, 2)$ or rotation anticlockwise 90° about wrong centre
(a)(ii)	Stretch [Factor] 2 Invariant [line] $y = -1$ oe	3	B1 for each
(b)	Translation $\begin{pmatrix} 8 \\ 0 \end{pmatrix}$	2	B1 for each

68. 0607_w21_ms_43 Q: 2

Question	Answer	Marks	Partial Marks
(a)	$(-5, -2)$	1	
(b)	$(2, 5)$	1	
(c)	$(-y, -x)$	2	B1 for each. If 0 scored SC1 for answer $(-2, -5)$
(d)	Reflection $y = -x$	2	B1 for each

69. 0607_s19_ms_43 Q: 6

Question	Answer	Marks	Partial Marks
(a)(i)	$(1, 5)$	1	
(a)(ii)	$(-y, -x)$	2	B1 for each co-ordinate
(a)(iii)	Reflection $y = -x$	2	B1 for each
(b)	Enlargement Scale factor 2 Centre $(0, 0)$	3	B1 for each
(c)	Stretch x -axis invariant SF 0.5	2	B1 for each

70. 0607_w17_ms_41 Q: 6

Question	Answer	Marks	Partial Marks
(a)	Translation $\begin{pmatrix} -5 \\ 6 \end{pmatrix}$	2	B1 for each
(b)	Triangle at (2, 6), (3, 6), (2, 12)	2	B1 for any stretch with x -axis invariant or stretch with scale factor 3 and $y = k$ invariant or stretch with y -axis invariant, s.f. = 3
(c)	90° [anti-clockwise] or 270° clockwise Centre $(a, a + 1)$ $x = a + 3$ OR 90° clockwise or 270° [anticlockwise] Centre $(b + 5, b)$ $y = b + 3$	3	B1 for each Dep on 90° anti-clockwise or 270° clockwise Dep on previous mark If 0 scored, SC1 for centre $(a, a + 1)$ and $x = a + 3$ OR B1 for each Dep on 90° clockwise or 270° anti-clockwise Dep on previous mark If 0 scored, SC1 for centre $(b + 5, b)$ and $y = b + 3$

71. 0607_w17_ms_43 Q: 8

Question	Answer	Marks	Partial Marks
(a)	$(-1, 5)$	2	B1 for each
(b)	$(-1, -5)$	2	B1 for each
(c)	Reflection y -axis oe	2	B1 for each

72. 0607_s16_ms_41 Q: 3

Question	Answer	Mark	Part Marks
(a) (i)	Quadrilateral drawn at (-1, -1), (-1, -2), (-3, -1), (-3, -3)	3	M2 for 3 pts correct or M1 for correct reflection of A in y-axis
(ii)	Reflection $y = -x$ oe	1 1	
(b) (i)	Quadrilateral drawn at (3, 1), (6, 1), (3, 3), (9, 3)	2	B1 for any stretch with y-axis invariant or with stretch factor 3
(ii)	Stretch, y-axis oe invariant (stretch factor) $\frac{1}{3}$	2	B1 for any 2 correct

73. 0607_s16_ms_43 Q: 9

Question	Answer	Mark	Part Marks
(a)	[QR =] P [PQR =] Q [ST =] Q [SQ =] T [PTP =] T [TPP =] S	6	B1 for each
(b) (i)	Points (2, 2) (2, 1) (5, 1)	2	B1 for (2, 1) or (5, 1) correct
(ii)	Points (2, -2) (2, -1) (5, -1)	1FT	FT their B reflected in x-axis
(iii)	Rotation 90 [anticlockwise] oe [Centre] (0, 0) oe	1 1 1	

74. 0607_s15_ms_42 Q: 2

Qu.	Answer	Mark	Part Marks
(a)	Rotation [Anticlockwise] 90° oe [About] (0, 0) oe	1 1 1	Combinations of transformations – lose all 3 marks
(b)	$\begin{pmatrix} 7 \\ k \end{pmatrix}$ $y = \frac{1}{2}k + 3$	1 1	any k Must be $\frac{1}{2}$ their k from vector
(c)	Triangle at (1, 2), (2, 2), (1, 6)	2	SC1 for stretch s.f. 2 with $y = 1$ invariant or triangle at (2, 1), (4, 1), (2, 3) i.e. y-axis invariant

75. 0607_s15_ms_43 Q: 2

Qu.	Answer	Mark	Part Marks
(a) (i)	Triangle $(-1, 1), (-1, 2), (-3, 1)$	2	SC1 for rotation 90° clockwise about $(0, 0)$ or rotation 90° anticlockwise about another point
(ii)	Triangle $(-1, -1), (-1, -2), (-3, -1)$	2FT	FT <i>their</i> (i) or SC1FT for reflection in $x = 0$
(iii)	Reflection $y = -x$	1 1	
(b)	Stretch [stretch factor] 3 Invariant line $x = 0$ oe	1 1 1	

76. 0607_w15_ms_43 Q: 5

Question	Answer	Mark	Part Marks
(a) (i)	Enlargement [factor] 0.5 oe [centre] $(0, 8)$	1 1 1	
(ii)	Enlargement [factor] 2 and [centre] $(0, 8)$	1 1FT	FT scale factor and centre
(b) (i)	Image at $(4, 4), (8, 4), (8, 6)$	2	M1 for $y = x$ drawn
(ii)	Image at $(6, 8), (6, 6), (10, 6)$	2	SC1 for 90° anti-clockwise but different centre
(c)	Reflection, x -axis oe	3	M2 for full method seen i.e. diagram or unit vectors. or M1 for one of transformations correctly carried out If 0 scored, SC1 for any reflection in answer