TRANSFORMATIONS

Pearson Edexcel – Thursday 4 June 2020 - Paper 2 (Calculator) Higher Tier

1.

15	Enlargement sf –1.5 centre (1, 1)	B2 (B1	for enlargement scale factor –1.5 **and** centre (1, 1) for enlargement scale factor –1.5 **or** enlargement centre (1, 1))	Award no marks if more than one transformation is given

Pearson Edexcel – Thursday 4 June 2020 - Paper 2 (Calculator) Higher Tier

2.

21	(a)	Graph drawn	C2 (C1	for graph reflected in the y-axis for a graph reflected in the x-axis **or** for a correct graph through four of the five key points)	Key points: (0, 0), (1, 2), (2, 1), (3, 0), (4, 2) Award C1 if line segments but goes through all key points
	(b)	$y = 5 + 2(x-3) - (x-3)^2$	C2 (C1	for $y = 5 + 2(x-3) - (x-3)^2$ oe eg $y = -x^2 + 8x - 10$, $y = -[(x-4)^2 - 6]$ for $y = 5 + 2(x+3) - (x+3)^2$ **or** $y = 5 + 2(x-a) - (x-a)^2$, $a \neq 3$, $a \neq 0$) **or** $y = f(x-3)$ **or** $y = (x-4)^2 + 6$ **or** correct expression missing "$y =$"	For either C mark accept equivalent expressions If a correct answer for C2 is given and is then incorrectly simplified, award C1 a need not be positive

Pearson Edexcel – Monday 8 June 2020 - Paper 3 (Calculator) Higher Tier

3.

11	(a)	rotation of 180° about (2.5, −1)	M1 A2 (A1	for method to find position of **Q**, eg shape drawn at (−1, −2), (−1, −5) and (−2, −5) **or** for method to find position of **R**, eg shape drawn at (4, −4), (4, −7) and (3, −7) **or** for method to translate their **Q** correctly for rotation of 180° about (2.5, −1) or enlargement by scale factor −1, centre (2.5, −1) for any 2 of the 3 aspects)	The method mark is awarded if no working is shown but at least 2 of the 3 aspects are correct in the description Cannot award A marks for a combination of transformations With no extra incorrect aspects
	(b)	(2.5, −1)	B1	for (2.5, −1) ft from rotation or enlargement in (a)	No follow through from a combined transformation in part (a)

Pearson Edexcel - Tuesday 21 May 2019 - Paper 1 (Non-Calculator) Higher Tier

4.

5	$c = -6$ $d = -1$	M1 A1 A1	for reflection in x-axis shown on diagram for $c = -6$ or $d = -1$ for both $c = -6$ and $d = -1$ SCB2 for $c = -1$ and $d = -6$	Vertices (3, −2), (5, −2), (3, −5) One correct value is M1A1 regardless of second value or diagram

Pearson Edexcel - Tuesday 6 November 2018 - Paper 1 (Non-Calculator) Higher Tier

5.

13	enlargement scale factor $-\frac{1}{3}$ centre (2, 2)	C2 (C1	for **all** of: enlargement, (scale factor =) $-\frac{1}{3}$ oe, (centre =) (2, 2) for **two** of: enlargement, (scale factor =) $-\frac{1}{3}$ oe, (centre =) (2, 2)) Note: award no marks if more than one transformation is given	

Pearson Edexcel - Thursday 8 November 2018 - Paper 2 (Calculator) Higher Tier

6.

8	Rotation 90° anticlockwise centre (−1,1)	M1 A1 A1	stating rotation **or** for showing **R** [(1,1), (1,−3), (3,−3)] for rotation of 90° anticlockwise for centre (−1, 1) given as a coordinate.	Award for a triangle in the correct position without the label R as long as this is the only triangle in lower right quadrant. Accept rotation of 270° clockwise Can be given as a coordinate alone. Do not award A marks if there is evidence of other transformations in the description, or other ambiguity in the answer given.

Pearson Edexcel - Thursday 24 May 2018 - Paper 1 (Non-Calculator) Higher Tier

7.

7	rotation 180° about (−1, −2) **or** enlargement sf −1 centre (−1, −2)	B2 (B1	rotation 180° about (−1, −2) **or** enlargement sf −1 centre (−1, −2) rotation 180° **or** rotation about (−1, −2) **OR** enlargement sf −1 **or** enlargement centre (−1, −2)) Award no marks for the description if more than one transformation is given SC B1 for fully correct diagram if B0 scored	Condone missing brackets but do not accept centre written as a vector Do not accept 'half turn' for 'rotation 180°' Ignore references to clockwise and anticlockwise Triangles at (−3, 1), (−5, 1), (−4, 3) and (−3, −5), (−5, −5), (−4, −7)

Pearson Edexcel - Thursday 7 June 2018 - Paper 2 (Calculator) Higher Tier

8.

7	Enlargement	B2 (B1	for correct enlargement at (1,2) (2,3) (2,4) (1,4) for correct size **and** orientation in the wrong position **OR** 3 of 4 vertices correct and joined **OR** 4 correct vertices not joined)	

Pearson Edexcel - Thursday 2 November 2017 - Paper 1 (Non-Calculator) Higher Tier

9.

18		Correct enlargement	B2 (B1	Correct enlargement (-1,-1.5), (-1,-3.5) (-2,-1.5) correct size, correct orientation in incorrect position **or** 2 out of 3 vertices correctly placed)

Pearson Edexcel - Monday 6 November 2017 - Paper 2 (Calculator) Higher Tier

10.

5 (a)		(−2, 1) (−4, 1) (−2, 2) (−5, 2)	B1	Shape labelled **A**
(b)		(1, −4) (3, −4) (1, −5) (4, −5)	B1	Shape labelled **B**

Pearson Edexcel - Thursday 8 June 2017 - Paper 2 (Calculator) Higher Tier

11.

9		No (supported)	M2 [M1 C1 M2 C1	for the correct position of C or E for a correct position of B or D] for No with correct supporting evidence, eg. showing C and E in the correct positions OR for C is a rotation of 90° anticlockwise about *O* **or** E is a rotation of 90° clockwise about *O* for No with supporting evidence, eg. C is a rotation of 90° anticlockwise about *O* **and** E is a rotation of 90° clockwise about *O*.

Pearson Edexcel - Specimen Papers Set 2 - Paper 2 (Calculator) Higher Tier

12.

1		Translation by$\begin{pmatrix}4\\-3\end{pmatrix}$	B1 B1	for translation $\begin{pmatrix}4\\-3\end{pmatrix}$

Pearson Edexcel - Specimen Papers Set 2 - Paper 3 (Calculator) Higher Tier

13.

13		Triangle (–6, 2), (–6, –1), (–3, –1)	M1 A1	for correct shape and the correct orientation in the wrong position or two vertices correct. cao

Pearson Edexcel - Sample Paper 1 - (Non-Calculator) Higher Tier

14.

20	(a)		(-2, -2)(-6, -2) (-2,-4) (-4, -4)	M1 A1	Shape drawn in correct orientation
	(b)		Enlargement sf −0.5 centre (0,0)	C1	

Pearson Edexcel - Thursday 26 May 2016 - Paper 1 (Non-Calculator) Higher Tier

15.

2	(a)		Correct shape	2	B2 for correct reflection with vertices (–4, 2) (–6, 3) (–6, 7) (–4, 6) (B1 for reflection in a vertical or horizontal line)
	(b)		Correct shape	2	B2 for correct rotation with vertices (–1, 3) (–5, 3) (–6, 5) (–2, 5) (B1 for rotation of 90(°) clockwise about (0,1) **or** correct orientation fully in top left quadrant)

Pearson Edexcel - Friday 6 November 2015 - Paper 2 (Calculator) Higher Tier

16.

12			Rotation about (2,1) through 180°	3	B1 rotation B1 about (2,1) B1 through 180° Or B2 enlargement scale factor −1 B1 about (2,1) Note Award no marks if more than one transformation is given

Pearson Edexcel - Thursday 4 June 2015 - Paper 1 (Non-Calculator) Higher Tier

17.

7	(a)		Triangle with vertices at (–3, 3), (–3, 4) and (–1, 4)	2	B2 for a triangle with vertices at (–3, 3), (–3, 4), (–1, 4) (B1 for triangle in correct orientation and size or rotated 90° clockwise about centre O or three correct vertices without joining)
	(b)		Reflection in line $y = x$	2	B1 for reflection B1 for (in the line) $y = x$ Note: award no marks if more than one transformation is given

Pearson Edexcel - Monday 8 June 2015 - Paper 2 (Calculator) Higher Tier

18.

4			Enlargement	2	B2 for fully correct triangle (B1 for 2 vertices correct or enlargement scale factor 2 in the wrong position or enlargement, centre A, with a different scale factor)

Pearson Edexcel - Friday 7 November 2014 - Paper 2 (Calculator) Higher Tier

19.

4	(a)		Correct shape	2	B2 cao (B1 for shape in the correct orientation below the line $y = x$ or for 2 vertices correct) with vertices at (2, 1), (4, 1), (4, 0), (3, 0)
	(b)		Translation by $\begin{pmatrix} 4 \\ -1 \end{pmatrix}$	2	B1 for translation B1 for $\begin{pmatrix} 4 \\ -1 \end{pmatrix}$ NB: B0 if more than one transformation given

Pearson Edexcel - Monday 9 June 2014 - Paper 1 (Non-Calculator) Higher Tier

20.

9	(a)		Shape drawn	2	B2 for shape with vertices at (0, –1), (–1, – 3), (–2, –3), (–2, –1) (B1 for rotation of 180° about the wrong centre)
	(b)		Triangle drawn	2	B2 for triangle with vertices at (6, 9), (9, 9), (9, 3) (B1 for 2 vertices correct or enlargement sf 3 in wrong position or enlargement, centre (0, 0), but sf >1, ≠ 3)

Pearson Edexcel - Friday 13 June 2014 - Paper 2 (Calculator) Higher Tier

21.

5			Translation $\begin{pmatrix} 5 \\ -3 \end{pmatrix}$	2	B1 for translation B1 for $\begin{pmatrix} 5 \\ -3 \end{pmatrix}$ NB No marks if more than one transformation given.

Pearson Edexcel - Wednesday 6 November 2013 - Paper 1 (Non-Calculator) Higher Tier

22.

6	(a)		Shape with vertices at (–1, 3), (0, 6), (2, 6), (1, 3)	1	B1 for correct shape in correct position
	(b)		Rotation centre (0,0) 90° anticlockwise	3	B1 rotation B1 (centre) (0,0) B1 90° anticlockwise or 270° clockwise Note: award no marks if more than one transformation is given

Pearson Edexcel - Wednesday 6 November 2013 - Paper 1 (Non-Calculator) Higher Tier

23.

23			Triangle with vertices at (–1,–4), (–1,–5), (–3,–4.5)	2	M1 for correct shape and size and the correct orientation in the wrong position or two vertices correct A1 cao

Pearson Edexcel - Tuesday 11 June 2013 - Paper 1 (Non-Calculator) Higher Tier

24.

7	(a)	(4,0) (3, 0) (3, -1) (2, -1) (2, 2) (4, 2)	Correct position	2	B2 for correct shape in correct position (B1 for any incorrect translation of correct shape)
	(b)		Rotation 180° (0,1)	3	B1 for rotation B1 for 180° (ignore direction) B1 for (0, 1) **OR** B1 for enlargement B1 for scale factor -1 B1 for (0, 1) (NB: a combination of transformations gets B0)

Pearson Edexcel - Thursday 28 February 2013 - Paper 1 (Non-Calculator) Higher Tier

25.

18		**Q** at (– 3, 1), (– 6, 1) (–5, 3) (– 3, 3) **R** at (–3, – 1), (–6, – 1), (–5, – 3) (–3, –3)	Rotation 180° about (–1, 0)	3	M1 for showing **R** correctly on the grid without showing **Q or** for showing **Q and R** correctly on the grid A1 for rotation of 180° A1 for (centre) (–1, 0) **Or** M1 for showing **R** correctly on the grid without showing **Q or** for showing **Q and R** correctly on the grid A1 for Enlargement Scale Factor –1 A1 for centre (–1, 0) **NB** Award no marks for any correct answer from an incorrect diagram or any Accuracy marks if more than one transformation is given

Pearson Edexcel - Thursday 28 February 2013 - Paper 1 (Non-Calculator) Higher Tier

26.

22		Vertices at (–2, –4), (–4, –4), (–4, –6), (–2, –5)	Correct diagram	3	M1 for a similar shape in the correct orientation in the third quadrant M1 for an image in the correct orientation of the correct size A1 cao

Pearson Edexcel - Monday 4 March 2013 - Paper 2 (Calculator) Higher Tier

27.

10			Translation; $\binom{6}{-1}$	2	B1 for translation B1 for $\binom{6}{-1}$ NB: B0 if more than one transformation given

Pearson Edexcel - Tuesday 6 November 2012 - Paper 1 (Non-Calculator) Higher Tier

28.

6			Enlargement, scale factor 2.5, centre (0,0)	3	B1 for enlargement B1 for scale factor 2.5 oe B1 for (0,0); accept origin or *O* NB: if two different transformations are stated then 0 marks.

Pearson Edexcel - Thursday 8 November 2012 - Paper 2 (Calculator) Higher Tier

29.

2	(a)		Triangle with vertices (1, 5) (4, 5) (4,7)	2	B2 correct reflection (B1 a translation of the correct answer with the final shape above $y = x$ **or** any two correct vertices) SC : B1 for a triangle with vertices at (2, 5) (4, 5) (4, 8)
	(b)		Translation by $\begin{pmatrix} -2 \\ -4 \end{pmatrix}$	2	B1 Translation B1 $\begin{pmatrix} -2 \\ -4 \end{pmatrix}$ NB. Award no marks for a combination of transformations

Pearson Edexcel - Monday 11 June 2012 - Paper 1 (Non-Calculator) Higher Tier

30.

9			Rotation 180° Centre (3, 3) **or** Enlargement Scale factor -1 Centre (3, 3)	3	B1 for rotation B1 for 180° B1 for (3, 3) **OR** B1 for enlargement B1 for scale factor -1 B1 for (3, 3) B0 for a combination of transformations

Pearson Edexcel - Wednesday 13 June 2012 - Paper 2 (Calculator) Higher Tier

31.

8	(a)		Triangle with vertices (2,–1) (4, –1) (4, –4)	2	B2 for triangle with vertices (2,–1) (4, –1) (4, –4) (B1 for triangle in correct orientation **or** rotated 90° anticlockwise centre O
	(b)		Triangle with vertices (7, 2) (13, 2) (7, 11)	3	B3 for triangle with vertices (7, 2) (13, 2) (7, 11) (B2 for 2 vertices correct or enlargement scale factor 3 in wrong position or enlargement, centre (1,2), with different scale factor) (B1 for 1 vertex correct or enlargement, not from (1,2), different scale factor)

Pearson Edexcel - Monday 5 March 2012 - Paper 4 (Calculator) Higher Tier

32.

15	(a)		Enlargement, scale factor 2, centre (5, 6)	3	B1 for Enlargement B1 for scale factor 2 B1 for (5, 6) (NB: a combination of transformations scores no marks)
	(b)		Correct reflection	2	M1 for a reflection in a line parallel to the y axis (see overlay) A1 cao

Pearson Edexcel - Monday 5 March 2012 - Paper 4 (Calculator) Higher Tier

33.

17			Rotation, 180°, centre (–1, 1)	3	B1 for rotation B1 for 180° (accept half turn) B1 for (–1, 1) (SC B1 for triangle with vertices (–3, 0) (–5, 0) (–3, –4) drawn) **OR** B1 for enlargement B1 for scale factor – 1 B1 for (– 1, 1) (NB: a combination of transformations scores no marks)

Pearson Edexcel - Wednesday 9 November 2011 - Paper 3 (Non-Calculator) Higher Tier

34.

5	(a)	Vertices at (–4, 2), (–4, 0), (0, 0) and (–2, 2)	Correct translation	2	M1 for any translation A1 cao
	(b)	Vertices at (4, 4), (2, 4) and (2, 8)	Correct reflection	2	M1 Line $y = x$ drawn or correct reflection in $y = -x$ A1 cao

Pearson Edexcel - Monday 6 June 2011 - Paper 3 (Non-Calculator) Higher Tier

35.

7	(a)		Reflection	2	B2 for vertices of shape plotted at (-3, 2), (-3, 3), (-5, 3), (-6, 2.5), (-5, 2) (B1 for a reflection in any vertical or horizontal line)
	(b)		Translation; $\begin{pmatrix} -6 \\ -1 \end{pmatrix}$	2	B1 for translation B1 (indep.) for 6 left and 1 down OR $\begin{pmatrix} -6 \\ -1 \end{pmatrix}$ Note B0 if more than one transfomation given

Pearson Edexcel - Friday 10 June 2011 - Paper 4 (Calculator) Higher Tier

36.

2			Correct enlargement s.f. $\frac{1}{2}$, centre P	3	B3 for correct enlargement s.f. $\frac{1}{2}$ centre P (B2 for correct enlargement s.f. $\frac{1}{2}$, incorrect centre or correct enlargement P, s.f $\neq \frac{1}{2}, 1$, centre P) (B1 for correct enlargement s.f $\neq \frac{1}{2}, 1$,, incorrect centre or for 2 sides correctly enlarged, s.f. $\frac{1}{2}$)

Pearson Edexcel - Friday 10 June 2011 - Paper 4 (Calculator) Higher Tier

37.

8			draw rotation	2	B2 for correct rotation, correct centre (B1 for correct orientation or 90° anticlockwise about O)

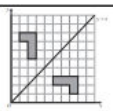
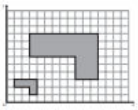
Pearson Edexcel - Tuesday 9 November 2010 - Paper 3 (Non-Calculator) Higher Tier

38.

12	(a)		Correct description	3	B1 for rotation B1 for about (0,0) B1 for 180° (accept half turn) NB: If more than one transformation seen then B0
	(b)		triangle with vertices (6, 1) (6, 4) (5, 4)	1	B1 cao

Pearson Edexcel - Friday 12 November 2010 - Paper 4 (Calculator) Higher Tier

39.

5	(a)			2	B2 cao (B1 for shape in the correct orientation above the line y = ***x*** or for shape elongated or shortened by one square but with either top or bottom in the correct position and in the correct orientation)
	(b)			3	B3 for correct enlargement in correct position (B2 for enlargement SF 3 in incorrect position or enlargement, centre ***O***, but different scale factor) (B1 for 4 lines enlarged by SF 3 or enlargement, not from ***O***, different scale factor)

Pearson Edexcel - Monday 7 June 2010 - Paper 3 (Non-Calculator) Higher Tier

40.

5			Triangle at (1,-2), (-1,-2), (1,-5)	2	B2 for triangle at (1,-2), (-1,-2), (1,-5) (B1 for rotation of 180° about the wrong centre or for a rotation of 90°, centre (1,0) clockwise or anticlockwise)

Pearson Edexcel - Monday 7 June 2010 - Paper 3 (Non-Calculator) Higher Tier

41.

6			Enlargement scale factor 2 centre (1,0)	3	B1 for enlargement B1 for scale factor 2 oe (eg 'x2',' by 2',' of 2') B1 for (1,0) [condone omission of brackets and/or the word 'centre'; do not accept a vector] Note: A combination of transformations gets NO marks

Pearson Edexcel - Thursday 5 November 2009 - Paper 3 (Non-Calculator) Higher Tier

42.

4	(a)		Enlarged P	2	B2 any correct enlargement (B1 at least one side drawn to a sf of 3) tol $\frac{1}{2}$ sq (B1 correct enlargement by SF $\neq 3$)
	(b)	Triangle at (2,–1),(3,–1),(2,–3)	Rotated Q	3	B3 fully correct (B2 correct orientation in correct quadrant or 90° anticlockwise about O) (B1 any rotation about O OR correct orientation in incorrect quadrant). SC B1 If Q is plotted correctly in all 4 quadrants then award

Pearson Edexcel - Tuesday 10 November 2009 - Paper 4 (Calculator) Higher Tier

43.

9			Rotation 180° Centre (0, 1)	3	B1 for rotation B1 for 180 (or half turn) B1 for (0, 1) OR B1 for enlargement B1 for scale factor −1 B1 for (0, 1) (B0 for any combination of transformations)

OCR GSCE – Tuesday 3 November 2020 – Paper 4 (Calculator) Higher Tier

44.

12	**(a)**		Triangle at (−1,3) (−1,5) (−4,3)	**2**	**B1** for either a correct translation 6 left or a correct translation 2 up	See overlay and for accuracy mark intent (± 2 mm by eye), condone good freehand
	(b)		Rotation [centre] (0, 0) 90° clockwise or −90° or 270° anti-clockwise	**1** **1** **1**	if **0** or **1** scored **B1** for correct reflection in $y = x$ on graph **B1** for correct reflection in x-axis on graph	mark to the candidate's advantage, for centre accept origin and O

OCR GSCE – Thursday 7 November 2019 – Paper 5 (Non-Calculator) Higher Tier

45.

15	**(a)**		Translation $\begin{pmatrix}-4\\-3\end{pmatrix}$ **oe**	**2**	**B1** for $\begin{pmatrix}-4\\-3\end{pmatrix}$ **oe** or for translation $\begin{pmatrix}-4\\k\end{pmatrix}$ **oe** or translation $\begin{pmatrix}k\\-3\end{pmatrix}$ **oe** If 0 scored, **SC1** for translation (–4, –3) or for triangle drawn on grid at (–1, 0), (–1, –1), (1, –1)	Extra transformations spoil all marks but allow SC1 mark Extra properties treat as choice oe e.g. 4 left and 3 down Use overlay ignore other triangles
15	**(b)**		Reflection x – axis **oe**	**3**	**B2** for reflection **B1** for x – axis **oe** If 0 scored, **SC2** for image drawn at (3, –3), (3, –2) and (5, –2) **SC1** for image drawn at (3, 3), (2, 3) and (2, 5)	Extra transformations spoil all marks but allow SC marks Extra properties treat as choice Use overlay ignore other triangles

OCR GSCE – Monday 11 November 2019 – Paper 6 (Calculator) Higher Tier

46.

17	**a**		(10, 11)	**2**	**B1** for a ray drawn through either point A and (6, 7) or point B and (2, 9)	
	b		−2	**2**	**B1** for 2	
	c		(4, 1)	**2**	**B1** for (4, *k*) or (*k*, 1)	

OCR GSCE – Tuesday 21 May 2019 – Paper 4 (Calculator) Higher Tier

47.

8	**(a)**		Rotation or enlargement [centre] (¯1, 0) 180° [sf] -1	**1** **1** **1**	double transformation scores **0, 0, 0** must be coordinates, condone missing final bracket ignore direction
8	**(b)**		Reflection $x = 5$	**1** **2**	double transformation may only score **B1** below **B1** for drawing line $x = 5$ or for a correct mirror line of *their final image*, not $x = 3$, drawn or written or for a correct final image or a correct follow through translation of the reflection of *their object* or the correct reflection of *their object*

OCR GSCE – Thursday 8 November 2018 – Paper 5 (Non-Calculator) Higher Tier

48.

10	**(a)**	**(i)**	Triangle drawn at (-3, -2), (-5, -2) (-3, -6)	**2**	**M1** for rotation 180° but wrong centre or 3 correct points not joined	Use overlay condone good freehand, mark intention If triangle B transformed then treat as misread in both parts (i) and (ii)
10	**(a)**	**(ii)**	Triangle drawn at (7, -5), (5, -5) (5, -1)	**2**	**M1** for translation by $\begin{pmatrix}2\\k\end{pmatrix}$ or $\begin{pmatrix}k\\-7\end{pmatrix}$ or 3 correct points not joined	Use overlay condone good freehand, mark intention

10	**(b)**		Enlargement $\frac{1}{2}$ **oe** (-1, 2)	**3**	**B1** for each element	Marks spoilt if extra transformations Treat extra descriptors as choice Condone omission of brackets Accept centre as a vector

OCR GSCE – Thursday 24 May 2018 – Paper 4 (Calculator) Higher Tier

49.

6	**(a)**		Reflection $y = x$ oe	**1** **1**		Double transformation scores 0
	(b)		Rotation [centre] (0,0) [+]90 or 90 anti-clockwise or −270 or 270 clockwise	**2** **1** **1**	If **0** scored then award **B2** for correct position of the intermediary triangle	Double transformation scores 0 unless the second one is reflection in $x = 0$ or in the x/y axis. accept origin and O as centre use overlay as a guide

OCR GSCE – Thursday 24 May 2018 – Paper 4 (Calculator) Higher Tier

50.

15	**(a)**		$(x-4)^2+9$	**3**	**B1** for $(x-4)^2$ **B2 FT** for 9	**FT** *their* $(x-4)^2$
	(b)		(4 , 9)	**2**	**B1FT** for each part	**FT** *their* $(x-4)^2+9$
	(c)		Translation $\begin{pmatrix}4\\9\end{pmatrix}$	**2**	**B1** for translation **B1FT** for $\begin{pmatrix}4\\9\end{pmatrix}$	award **B1** if it FT from either (a) or (b) and condone e.g. 4 right 9 up

OCR GSCE – Tuesday 6 November 2017 – Paper 5 (Non - Calculator) Higher Tier

51.

5	**(a)**		Image at (1, –3), (3, –3), (1, –6)	**2**	**B1** for reflection in any horizontal line or for reflection in $x = -1$	Use overlay mark intention isw other shapes
	(b)		Enlargement [sf] ½ oe [centre] (5, 7)	**3**	**B1** for each	More than one transformation given spoils all 3 marks Extra properties treat as choice

OCR GSCE – Thursday 25 May 2017 – Paper 4 (Calculator) Higher Tier

52.

11	**(a)**		Correct translation	**2**	**B1** for a correct horizontal translation or a correct vertical translation	Condone freehand, points must be joined for **2** marks, **B1** if all correct and not joined
	(b)	**(i)**	rotation (0,0) oe 90° [anticlockwise] oe	**1** **1**	if **0** scored **M1** for the triangle/dots on the grid correctly rotated twice for centre allow origin and O and for angle allow e.g. -270°, 270° clockwise	Double transformation can only score **M1**
		(ii)	Rotation (0,0) oe 180°	**1** **1** **1**	if **0** scored **M1** for the triangle /dots on the grid correctly reflected twice or **SC2** for "rotation (0,0) oe, 90°" written twice for centre allow origin and O	Allow enlargement (0,0) [sf=] -1 for **3** marks Other double transformations can only score **M1**

OCR GSCE – Tuesday 13 June 2017 – Paper 6 (Calculator) Higher Tier

53.

9	a		Triangle with vertices at (1, 6), (2, 6), (2, 4)	3 3 AO2.3b	**B2** for triangle correct size and orientation in wrong position OR **B1** for enlargement centre (-1, 5) incorrect scale factor < 1 or for triangle with two vertices correct or for three rays from (-1, 5) to vertices of triangle A or for triangle correct size but wrong orientation	
	b	i	Height factor is square root of area factor oe in words or figures	1 1 AO2.5a	Mark the best bit so long as no contradiction	Must include correct reference to square or square root
		ii	16.5 to 16.6	3 2 AO1.3b 1 AO3.1b	**B2** for $(\sqrt{3})^3$ oe or $\frac{1}{(\sqrt{3})^3}$ oe soi by 5.19 to 5.20 or 0.192 to 0.193 OR **B1** for $\sqrt{3}$ or $\frac{1}{\sqrt{3}}$ oe soi by 1.73[…] or 0.577[…]	Accept $\frac{86\sqrt{3}}{9}$ oe Note that $(\sqrt{3})^3 = 3\sqrt{3}$ and $\frac{1}{(\sqrt{3})^3} = \frac{\sqrt{3}}{9}$

OCR GSCE – Sample Papers – Paper 4 (Calculator) Higher Tier

54.

12	(a)		$\sqrt{20} = \sqrt{4 \times 5}$ $= \sqrt{4} \times \sqrt{5}$ $= 2\sqrt{5}$	2 2 AO1.3a	**M1** for $\sqrt{4} \times \sqrt{5}$	
	(b)		Either point which is 4 across and 2 up from A or 2 across and 4 up	3 1 AO2.3b 1 AO3.1a 1 AO3.2	**B1** for $a^2 + b^2 = 20$ **B1** for 4 and 16 (or 2 and 4) seen If zero scored **SC1** for correctly marking the position of *their a* and *b*	Condone both correct points marked

AQA GSCE – Tuesday 19 May 2020 – Paper 1 (Non - Calculator) Higher Tier

55.

Q	Answer	Mark	Comments
29	$(x-4)^3$	B1	$(x+4)^3$ is B0
	$x^2-4x-4x+16$ with 3 terms correct or x^2-8x+k where k is a non-zero constant	M1	ft $(x+4)^3$ only
	$x^3-4x^2-4x^2+16x-4x^2+16x+16x-64$ (+ 6) or $x^3-8x^2+16x-4x^2+32x-64$ (+ 6) or $x^3-12x^2+48x-64$ (+ 6)	M1dep	oe full expansion of their 4 terms by $(x-4)$ with at least 4 terms correct or full expansion of their 3 terms by $(x-4)$ with at least 3 terms correct ft $(x+4)^3$ only
	$x^3-12x^2+48x-58$	A1	
	Additional Guidance		
	Using $(x+4)^3$ can score a maximum of B0M1M1A0		
	$x^2+4x+4x+16$ with 3 terms correct or x^2+8x+k where k is a non-zero constant		B0M1
	$x^3+4x^2+4x^2+16x+4x^2+16x+16x+64$ (+ 6) or $x^3+8x^2+16x+4x^2+32x+64$ (+ 6) or $x^3+12x^2+48x+64$ or $x^3+12x^2+48x+70$		B0M1M1A0

AQA GSCE – Thursday 4 June 2020 – Paper 2 (Calculator) Higher Tier

56.

Q	Answer	Mark	Comments
24(a)	(–5, –2)	B2	B1 point (1, –4) from rotation may be seen on the diagram or point (–5, –2) marked on diagram SC1 (–7, 6)
	Additional Guidance		
	(–5, –2) marked on diagram and answer (–2, –5)		B1

Q	Answer	Mark	Comments
24(b)	$y = -x$	B1	
	Additional Guidance		

AQA GSCE – Tuesday 11 June 2019 – Paper 3 (Calculator) Higher Tier

57.

5	Isosceles triangle with base 2 cm and height 3 cm in any orientation	B2	± ¼ square on base or height B1 isosceles triangle with base 2 cm or height 3 cm in any orientation or acute angled triangle with base 2 cm and height 3 cm in any orientation
	Additional Guidance		
	Mark intention for isosceles triangle within tolerance, lines do not need to be ruled		
	Enlargement can be drawn wholly or partially inside the original		
	Correct vertices not connected		B1
	Right angled isosceles triangle		B0

AQA GSCE – Tuesday 11 June 2019 – Paper 3 (Calculator) Higher Tier

58.

25(a)	Reflection	B1	
	$y = 1$ or AC	B1	
	Additional Guidance		
	Mirror line		B0
	Contradiction for line of reflection		B0
	More than one transformation given		B0

25(b)	**Alternative method 1**		
	Rotation	B1	
	Centre (0, 1)	B1	
	180°	B1	degrees symbol does not have to be seen
	Alternative method 2		
	Enlargement	B1	
	Centre (0, 1)	B1	
	Scale factor –1	B1	
	Additional Guidance		
	For centre (0, 1) allow about (0, 1) or (0, 1)		B1
	For centre (0, 1) do not allow 0, 1		B0
	More than one transformation given eg rotation then translation		B0
	Do not allow half turn for 180°		
	Ignore clockwise or anticlockwise		
	For scale factor allow sf or scale or (×) –1		

AQA GSCE – Monday 12 November 2018 – Paper 3 (Calculator) Higher Tier

59.

1	up	B1	
	Additional Guidance		

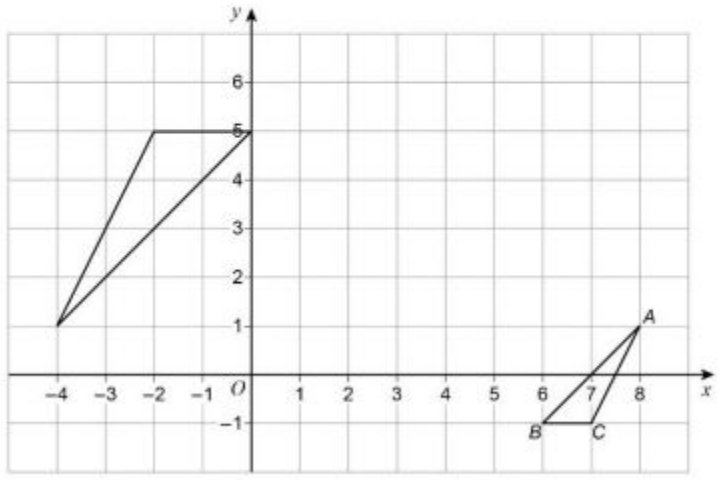
AQA GSCE – Monday 24 May 2018 – Paper 1 (Non - Calculator) Higher Tier

60.

2	$\begin{pmatrix} 2 \\ -3 \end{pmatrix}$	B1	

AQA GSCE – Monday 24 May 2018 – Paper 1 (Non - Calculator) Higher Tier

61.

21	Triangle with vertices (–4, 1) and (0, 5) and (–2, 5)	B2	B1 one of (–4, 1) (0, 5) (–2, 5) or triangle correct size and orientation in wrong position
	Additional Guidance		
	Triangle must be drawn for B2		
	Ignore labelling of vertices on enlarged triangle		
			B2

AQA GSCE – Tuesday 12 June 2018 – Paper 3 (Calculator) Higher Tier

62.

6	54	B1	May be on diagram
	7.5 6	B2	May be on diagram B1 for 1 correct or for answers transposed
	Additional Guidance		
	If answers are in wrong position on answer lines, check working and diagram for clear indication of possible transcription errors eg $w = 9 \div 1.5 = 6$ in working, 9 on answer line $9 \div 1.5 = 6$ in working, 9 on answer line		 B1 B0
	Answer line takes precedence over diagram eg $x = 54$ on diagram and $x = 81$ on answer line		B0

AQA GSCE – Thursday 6 November 2017 – Paper 2 (Calculator) Higher Tier

63.

7	Enlargement	B1	
	Scale factor $(\times)\frac{1}{3}$	B1	
	Centre (5, 1)	B1	
	Additional Guidance		
	Enlarge $(\times)\frac{1}{3}$ (5, 1)		B1B1B1
	Reduction or makes bigger or unenlargement or increase or negative enlargement		1st B0
	Any other transformation mentioned or implied such as reflection, rotation or translation loses the mark for enlargement eg enlarged and moved up 4 or enlarged and $\begin{pmatrix} -2 \\ 2 \end{pmatrix}$		1st B0
	Do not accept ÷ 3 for scale factor		2nd B0

AQA GSCE – Wednesday 25 May 2017 – Paper 1 (Non - Calculator) Higher Tier

64.

21(a)	Ticks No and gives valid reason	B1	Examples of valid reasons: translation (by $\begin{pmatrix}6\\0\end{pmatrix}$) $\begin{pmatrix}6\\0\end{pmatrix}$ or $\left(\frac{6}{0}\right)$ or (6, 0) rotation (of 180°), (centre (0, 2.5)) enlargement (of scale factor) –1 (about (0, 2.5))
	Additional Guidance		
	Full descriptions are not needed, but if given must be correct For the enlargement, the scale factor of –1 must be given		
	Transformation (6, 0)		B1
	Moved 6 to the right		B1
	Moved 6 squares		B0
	Condone 'turn' with full description of 180°, (centre) (0, 2.5)		B1
	2 or more single transformations given, with at least 1 correct		B1

21(b)	Enlargement, scale factor –2, centre (–1, 0)	B3	B2 Enlargement, scale factor –2 or enlargement centre (–1, 0) or scale factor –2, centre (–1, 0) B1 (Triangle with) vertices at (0, –1) (0, –3) and (3, –2) or enlargement or scale factor –2 or scale factor 2
	Additional Guidance		
	'Scale factor' and 'centre' may be implied eg enlargement, –2, (–1, 0)		B3
	Allow '–1 on the x-axis' for (–1, 0)		
	No triangle on diagram, but vertices stated as coordinates and no other marks awarded		B1
	A combination of transformations can score a maximum of 1 mark for the triangle drawn or vertices identified		
	Correct triangle drawn and 'enlargement', with no other marks awarded		B1
	Enlargement, (scale factor) $-\frac{1}{2}$, centre (–1, 0)		B2

AQA GSCE – Thursday 8 June 2017 – Paper 2 (Calculator) Higher Tier

65.

26(a)	*B*	B1	
	Additional Guidance		

26(b)	*P*	B1	
	Additional Guidance		

AQA GSCE – Sample Paper 1 (Non - Calculator) Higher Tier

66.

23(a)	0	B1	
23(b)	1	B1	
23(c)	2	B1	