Question	Scheme	Marks
4.(a)	Stretch – SF 3 parallel to the *y*-axis	**M1 A1**
		(2)
(b)	$\mathbf{B} = \begin{pmatrix} -\frac{\sqrt{3}}{2} & \frac{1}{2} \\ -\frac{1}{2} & -\frac{\sqrt{3}}{2} \end{pmatrix}$	**B1**
		(1)
(c)	$\mathbf{C} = \mathbf{BA} = \begin{pmatrix} -\frac{\sqrt{3}}{2} & \frac{1}{2} \\ -\frac{1}{2} & -\frac{\sqrt{3}}{2} \end{pmatrix}\begin{pmatrix} 1 & 0 \\ 0 & 3 \end{pmatrix}$	**M1**
	$\mathbf{C} = \begin{pmatrix} -\frac{\sqrt{3}}{2} & \frac{3}{2} \\ -\frac{1}{2} & -\frac{3\sqrt{3}}{2} \end{pmatrix}$	**A1**
		(2)
(d)	$\det \mathbf{C} = -\frac{\sqrt{3}}{2} \times -\frac{3\sqrt{3}}{2} - \frac{3}{2}\left(-\frac{1}{2}\right) = 3$ So area of $H¢$ is $5 \times \det \mathbf{C} = ...$	**M1**
	= 15	**A1**
		(2)
		(Total 7 marks)

Notes

(a)

M1: Identifies one correct aspect, EITHER **stretch** (or allow scaling)
OR scale factor 3 **and** correct direction indicated (need not be precise).

A1: Fully correct description with both aspects correct. Must mention stretch or scaling, but be tolerant with the description of direction and scale factor as long as both are clear. Accept e.g. parallel to the *y*-axis, *y* direction, in *y* axis, or vertically for direction, but not "about *y*" (reflection implied). Accept e.g. scale factor 3, by 3, ×3 or three times for the scale factor. Ignore references to "about origin" or additional references to stretch of factor 1 parallel to the *x*-axis.

Some examples:

- "stretched by 3 in direction of *y* axis".
- "stretch the *y* for scale factor of 3."

  Both the above score M1A1. Stretch stated, direction and scale factor 3 both indicated.
- "enlargement scale factor 3 for *y*-axis."
- "A enlarge by three times paralleled to *y*-axis."

  Both score M1A0 Indicates direction and scale factor but does not mention stretch or scaling.
- "the *y*-axis will be enlarged by three times, whereas the *x*-axis stay the same."

  M1A0 Indicates direction and scale factor but does not mention stretch or scaling, the reference to the *x*-axis is ignored as not incorrect.

(b)

B1: Correct matrix. Must be exact (trig terms evaluated) and seen in (b).

(c)

M1: Attempts to multiply matrices the right way around. Implied by 3 correct entries if no product shown.

A1: Correct matrix. Must be exact.

(d)

M1: Attempts determinant of **C** (or deduces area scale factor is 3) and multiplies by 5. Implied by a correct answer if no incorrect working is seen.

A1: Cao. Allowed if scored from a **C** arising from multiplication the wrong way round in (c) or an incorrect **B** that has determinant ±1