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The diagram shows a curve which has a maximum point at $(8, 12)$ and a minimum point at $(8, 0)$. The curve is the result of applying a combination of two transformations to a circle. The first transformation applied is a translation of $\begin{pmatrix} 7 \\ -3 \end{pmatrix}$. The second transformation applied is a stretch in the y-direction.

(a) State the scale factor of the stretch. [1]

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(b) State the radius of the original circle. [1]

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(c) State the coordinates of the centre of the circle after the translation has been completed but before the stretch is applied. [2]

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(d) State the coordinates of the centre of the original circle. [2]

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