

## STEP II, 2012, Q5 EC

**Q5** Another popular question, but scoring a relatively low average mark overall; however, this was partly due to the high number of partial attempts, and good efforts usually scored around 14 marks. Surprisingly, the greatest difficulty was found in the differentiation in part (ii). There were lots of marks for the curve-sketching, and several easy features to work with: principally the symmetry and the asymptotes (and the behaviour of the functions on either side of these). For many who struggled, the biggest problem lay in where to put the  $y$ -axis, which was largely immaterial. As mentioned already, differentiation attempts were rather poor on the whole, with muddling of the *Chain*, *Product* and *Quotient Rules*. Even for those who differentiated correctly, extracting the factor  $(2x - a - b)$  proved too tough, despite the fact it might have been obvious with a bit of thought.



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