

## STEP II, 2011, Q1 EC

**Q1** The first question is invariably set with the intention that everyone should be able to attempt it, giving all candidates something to get their teeth into and thereby easing them into the paper with some measure of success. As mentioned above, this was both a very popular question and a high-scoring one. Even so, there were some general weaknesses revealed in the curve-sketching department, as many candidates failed to consider (explicitly or not) things such as the gradient of the curve at its endpoints and, in particular, the shape of the curve at its peak (often more of a vertex than a maximum). It was also strange that surprisingly many who had the correct domain for the curve *and* had decided that the single point of intersection of line and curve was at  $x = 1$  still managed to draw the line  $y = x + 1$  **not** through the endpoint at  $x = 1$ . Most other features – domain, symmetry, coordinates of key points, etc. – were well done in (i). Unfortunately, those who simply resort to plotting points are really sending quite the wrong message about their capabilities to the examiners.

Following on in (ii), the majority of candidates employed the expected methods and were also quite happy to plough into the algebra of squaring-up and rearranging; however, there were frequently many (unnecessarily) careless errors involved. The only other very common error was in the sketch of the **half-parabola**  $y = 2\sqrt{1-x}$ , due to a misunderstanding of the significance of the radix sign.



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