

STEP II, 2001, Q1

- 1 Use the binomial expansion to obtain a polynomial of degree 2 which is a good approximation to $\sqrt{1-x}$ when x is small.
- (i) By taking $x = 1/100$, show that $\sqrt{11} \approx 79599/24000$, and estimate, correct to 1 significant figure, the error in this approximation. (You may assume that the error is given approximately by the first neglected term in the binomial expansion.)
- (ii) Find a rational number which approximates $\sqrt{1111}$ with an error of about 2×10^{-12} .



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