



## **STEP III, 2001 Q12**

- 12** A bag contains  $b$  black balls and  $w$  white balls. Balls are drawn at random from the bag and when a white ball is drawn it is put aside.
- (i) If the black balls drawn are also put aside, find an expression for the expected number of black balls that have been drawn when the last white ball is removed.
  - (ii) If instead the black balls drawn are put back into the bag, prove that the expected number of times a black ball has been drawn when the first white ball is removed is  $b/w$ . Hence write down, in the form of a sum, an expression for the expected number of times a black ball has been drawn when the last white ball is removed.



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