1.   The random variable X has a χ^2-distribution with 9 degrees of freedom.

(a)   Find P$(2.088 < X < 19.023)$.

(3)

The random variable Y follows an F-distribution with 12 and 5 degrees of freedom.

(b)   Find the lower and upper 5% critical values for Y.

(3)
(Total 6 marks)

1.   (a) $P(X > 19.023) = 0.025$ or $P(X < 19.023) = 0.975$ both B1

               $P(X > 2.088) = (0.990$ or $P(X < 2.088) = 0.010$

               $\therefore P(2.088 < X < 19.023) = 0.990 - 0.025$ or $0.975 - 0.010$ M1

                                      $= \underline{0.965}$ A1   3

     (b)   Upper Critical value of $F_{12,5} = 4.68$ B1

            Lower Critical value of $F_{12,5} = \dfrac{1}{F_{5,12}}$ M1

                            $= \dfrac{1}{3.11} = 0.3215\ldots$ A1   3

         awrt 0.322

[6]

1. Many candidates were able to answer this question correctly but too many showed that they had not understood the F-distribution tables. A clear shaded and labelled diagram would have helped many candidates.