7 The geometric series G has first term a, common ratio r and nth term u_n

Given that $u_4 = e^{x+2}$ and that $u_7 = e^{\frac{2x+1}{2}}$

(a) show that $r = e^{-\frac{1}{2}}$

(3)

(b) Hence find a in terms of e and x.

(3)

Given that the sum to infinity of G can be written as $\dfrac{e^p}{e^{\frac{1}{2}} - 1}$

(c) find an expression for p in terms of x.

(3)

Given that $u_{18} > 1.6$ and that x is an integer,

(d) find the least value of x.

(4)

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(Total for Question 7 is 13 marks)