**1** Given that, find the value of *k* **(4 marks)**

**2** Show that  **(4 marks)**

**3 a** Show that  **(3 marks)**

**b** Find the smallest value of *k* for which  **(2 marks)**

**4** Given that  and , find the values of the constants *a* and *b* **(4 marks)**

**5** , where *a* and *b* are rational constants. Given that  and 

**a** find an expression for  **(7 marks)**

**b** hence calculate  **(2 marks)**

**6** **a** Show that . **(4 marks)**

**b** Hence evaluate  **(3 marks)**

**7** **a** Show that  **(4 marks)**

**b** Hence evaluate  **(2 marks)**

**8** Find the value of *n* that satisfies  **(5 marks)**

**9** **a** Show that  **(3 marks)**

**b** Hence show that  **(3 marks)**