**Self-assessment: 4 Algebraic structures**

**1.** Find the exact solution of the equation e2*x* + 2e*x* = 15.

*(accessible to students on the path to grade 3 or 4) [5 marks]*

**2.** Sketch the graph of , indicating clearly the equations of any asymptotes and maximum or minimum points.

*(accessible to students on the path to grade 3 or 4) [4 marks]*

**3.** Find the range of values of *x* for which 2e2*x* ≤ *x* + 3.

*(accessible to students on the path to grade 3 or 4) [4 marks]*

**4.** Find the exact coordinates of the points of intersection of the graphs of *y* = *x*2 + 1 and *y* = 5 − *x*.

*(accessible to students on the path to grade 5 or 6) [6 marks]*

**5.** (a) Find the value of the parameter *k* for which the following system of equations is consistent:



(b) For the value of *k* found above, find the general solution of the system.

*(accessible to students on the path to grade 5 or 6) [11 marks]*