5. [8 points] Consider the function $h(x)$ where k and A are constants:

$$h(x) = \begin{cases} 2x + 1 & x \leq k \\ (x - A)^2 + 2 & x > k \end{cases}$$

a. [5 points] There is exactly one choice of the constants A and k that make $h(x)$ differentiable. Find these values of A and k.

Answer: $A =$ _____ **Answer:** $k =$ _____

b. [3 points] If $A > k$, then $h(x)$ has two critical points. What are the x-coordinates of these points? Your answers may be in terms of A and/or k. Show work or briefly explain your reasoning.

Answer: Critical point(s) at $x =$ _____

