Determine the equation of the perpendicular bisector of the line segment with endpoints (-1,2) and (5,4).

Solution: We will assume, that the line segment has endpoints $A(x_1,y_1)$ and $B(x_2,y_2)$. The bisector passes through the midpoint $M(x_m,y_m)$ of the line segment AB, it has coordinates $x_m = (x_1 + x_2)/2 = (-1 + 5)/2 = 2$; $y_m = (y_1 + y_2)/2 = (2 + 4)/2 = 3$. Then, we will find the slope k' of the line segment, $k' = (y_2 – y_1)/(x_2 – x_1) =$ $= (4-2)/(5-(-1)) = 1/3$. After that we will calculate the slope of the bisector according to the condition of perpendicularity, $k = -1/k' = -3$. The equation of the perpendicular bisector will look as $y = k \cdot x + b$. After the substitution of $x = x_m = 2$ and $y = y_m = 3$ we can find the coefficient b: $3 = -3 \cdot 2 + b$, $b = 9$.
Then, equation of the perpendicular bisector of the line segment AB is: $y = -3 \cdot x + 9$.

Answer: $y = -3 \cdot x + 9$.