Task. Find the quadratic equation of the line passing through the following points:

x	-2	-1	0
y	5	2	1

Solution. The quadratic equation is given by the following formula:

$$y = ax^2 + bx + c.$$

We should find its coefficients a, b, and c.

Substituting corresponding values of x and y we obtain the following three equations:

$$y(-2) = 5, \qquad y(-1) = 2, \qquad y(0) = 1 :$$

$$5 = y(-2) = a * (-2)^2 + b * (-2) + c = 4a - 2b + c$$

$$2 = y(-1) = a * (-1)^2 + b * (-1) + c = a - b + c$$

$$1 = y(0) = a * 0^2 + b * 0 + c = c$$

$$\begin{cases} 4a - 2b + c = 5 \\ a - b + c = 2 \\ c = 1 \end{cases}$$

Substituting $c = 1$ into the first and second equation we obtain

$$\begin{cases} 4a - 2b + 1 = 5 \\ a - b + 1 = 2 \\ c = 1 \end{cases} \quad \Rightarrow \quad \begin{cases} 4a - 2b = 4 \\ a - b = 1 \\ c = 1 \end{cases}$$

Multiplying the second equation by -2 and adding to the first equation we get:

$$\begin{cases} 4a - 2b = 4 \\ -2a + 2b = -2 \end{cases} \quad \Rightarrow \quad 4a - 2b + (-2a + 2b) = 4 - 2$$

$$4a - 2a = 2 \quad \Rightarrow \quad 2a = 2 \quad \Rightarrow \quad a = 1$$

Hence from $a - b = 1$ we obtain

$$b = a - 1 = 1 - 1 = 0.$$

Thus the equation of the line is given by the following formula:

$$y = x^2 + 1.$$

Answer. $y = x^2 + 1$.