Question. Find the line through the point $(3, 3)$ with a slope of -1

Solution. The equation of a line with slope k has the following form:

$$y = kx + b$$

for some b. In our case $k = -1$, so we get the equation

$$y = -x + b.$$

To find b use the assumption that the line passes through the point $(3, 3)$. This means that substituting coordinates of this point into the equation we will get the identity. Thus

$$3 = -3 + b,$$

whence

$$b = 3 + 3 = 6.$$

Thus the line through the point $(3, 3)$ with a slope of -1 has the folowing equation:

$$y = -x + 6.$$

Answer. $y = -x + 6$.