Question#37457 - Mathematics - Geometry

In the coordinate plane the point $X(0,-3)$ is translated to the point $X'(-3,0)$. Under the same translation the points $Y(4,-6)$ and the $Z(-4,-5)$ as translated to Y' and Z' respectively what are the coordinates of Y' and Z'?

Solution:

Point $X(x_x,y_x)$ is translated using the rule $(x_x,y_x) \to (x_x+\Delta x, y_x+\Delta y)$

Given:

$x_x = 0, \quad y_x = -3$

$x_x + \Delta x = x'_x = -3, \quad y_x + \Delta y = y'_x = 0$

So

$0 + \Delta x = -3, \quad -3 + \Delta y = 0$

$\Delta x = -3, \quad \Delta y = 3$

If the points $Y(x_y,y_y)$and the $Z(x_z,y_z)$translated under the same translation, then

$x'_y = x_y + \Delta x = 4 - 3 = 1$

$y'_y = y_y + \Delta y = -6 + 3 = 3$

$x'_z = x_z + \Delta x = -4 - 3 = -7$

$y'_z = y_z + \Delta y = -5 + 3 = -2$

Given:

$x_y = 4,\ y_y = -6$ and $x_z = -4,\ y_z = -5$, so

$x'_y = 4 - 3 = 1$

$y'_y = -6 + 3 = 3$

and

$x'_z = -4 - 3 = -7$

$y'_z = -5 + 3 = -2$

Answer: $Y' = (1,3)$ and $Z'(-7,-2)$