Digital Image Processing HW1
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1 Question 2

We observe that the graph is well oriented in X and Y coordinates, i.e., on moving the cursor along the X axis in the graph, only the X value in MATLAB's `impixelinfo` coordinates changes and similarly for the Y coordinates.
Secondly the graph's (0) in X corresponds to (570) in MATLAB. (This is assuming the graph's X is in the left right direction (which seems unlikely given that it graphs a one-many function). This tells us that we should translate the coordinates by -570 in X before scaling.
A change of 10 in the graph's X coordinates corresponds to a change of 160 in MATLAB's X and a change of 10 in the graph's Y coordinates corresponds to a change of 154 in MATLAB. This gives us a scaling factor of 1/16 in X and 1/15.4 in Y.
To calculate the Y translation we choose the Y coordinate of a point P:

$$P_{yMATLAB} = 1520 \tag{1}$$
$$P_{yGraph} = 635 \tag{2}$$
$$\tag{3}$$

We want to find the translation constant k_y

$$\frac{P_{yMATLAB} - k_y}{15.4} = P_{yGraph} \tag{4}$$
$$k_y = 8260 \tag{5}$$

The final equation thus becomes

$$x_{graph} = \frac{(x_{MATLAB} - 570)}{16} \tag{6}$$
$$y_{graph} = \frac{(y_{MATLAB} - 8260)}{15.4} \tag{7}$$