[4]   **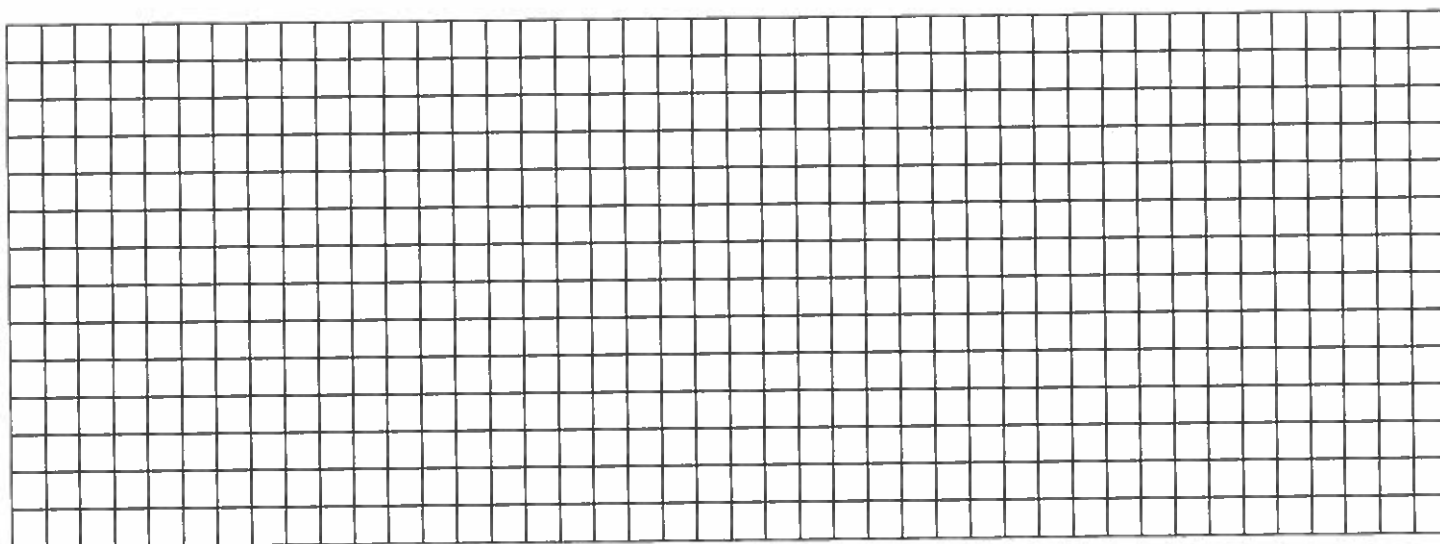1.** Describe in as much detail as possible what transformations of $y = x^2$ took place if the final equation is $y = -3(x + 1)^2 + 4$? (You can use abbreviations such as VE, VC, HT, VT, R for reflection).

[4]   **2.** Graph $y = 0.5(x - 3)^2 + 1$. Include clearly labeled x and y axis.

[6]   **3. A)** Write the mapping notation for the following transformations (one notation for all 4 transformations): Vertical compression by one third, reflection in the x-axis, vertical translation down by 2 units and horizontal translation left by 6 units.

B) What are the coordinates of the point (-3,9) that was on the original parabola before all the above transformations took place?

[4]   **4.** Write mapping notation for $y = -5(x + 3)^2 + 4$

[6]   **5.A)** Identify which equation is in vertex form and which equation is in standard form.

$y = -3(x + 1)^2 + 4$ $y = 3x^2 - 18x + 24$

_____   _____

B) Change the standard form equation into vertex form and the vertex form into standard form. Show your work please.

[2]   **6.** Will a parabola reflected in the x-axis have a maximum, minimum or neither?