

YOUR NAME: _____

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Read each problem **very carefully** before starting to solve it. Each problem is worth around 5 points. It is necessary to show **all** your work. Correct answers without explanations are worth 0 points. GOOD LUCK!!

1. Consider the hyperbola with equation $4x^2 - 32x - y^2 - 4y + 44 = 0$. Find its center, its vertices and its foci.

2. A hyperbola has center at $(1, 7)$, a vertex at $(1, 12)$ and one of its asymptotes is $y - 7 = 10(x - 1)$. Find an equation of the hyperbola.

3. (a) Use a small table of values to sketch the graph of $y = \left(\frac{1}{2}\right)^x$.

(b) Describe, in a short and precise sentence, which transformations are needed to get from the graph in Part (a) to the graph of the function $y = \left(\frac{1}{2}\right)^{x+7} + 2$.