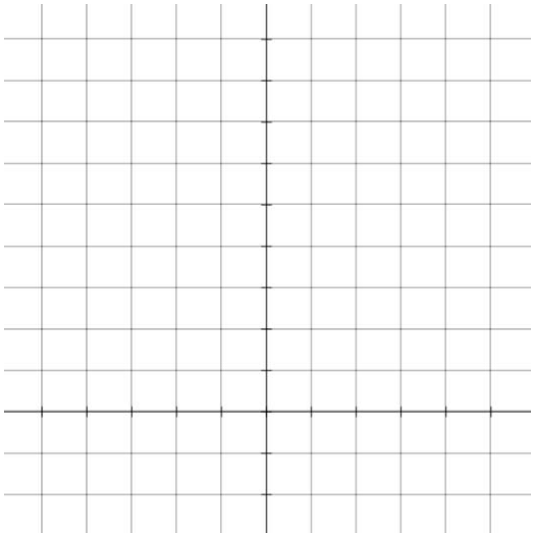
5.2 Transformations of Exponential Functions Worksheet

1) Describe the transformations that map the function $y = 2^x$ onto each of the following functions…

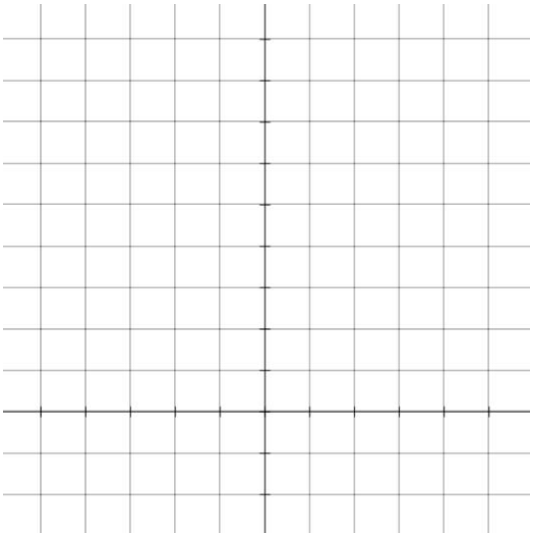
a) $y = 2^x - 2$ **b)** $y = 2^{x+3}$ **c)** $y = 4^x$ **d)** $y = 3(2^{x-1}) + 1$

2) Create a sketch of each graph for each equation in question 1. (a table of values may help)

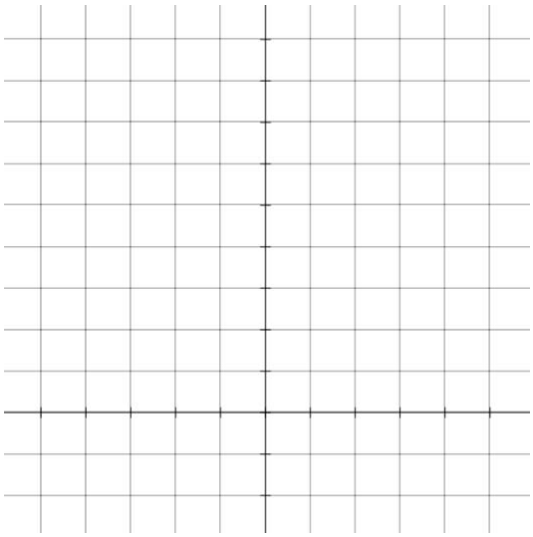
a)



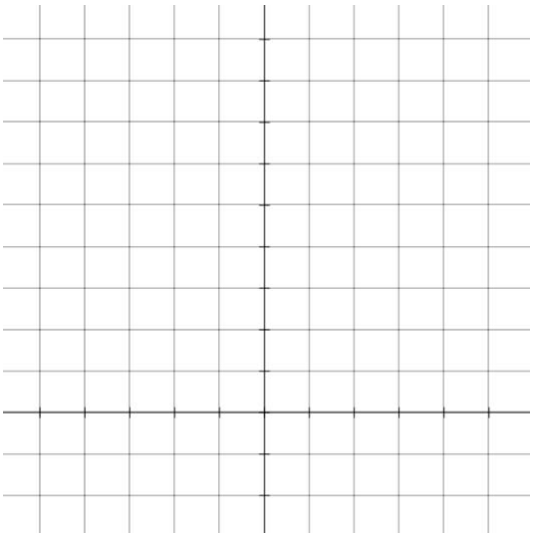
b)



c)



d)



3) Write the equation for the function that results from each transformation applied to the base function $y = 5^x$.

a) translate down 3 units

b) shift right 2 units

c) translate left $\frac{1}{2}$ unit

d) shift up 1 unit and left 2.5 units

4) Describe the transformations that map the function $y = 8^x$ onto each function.

a) $y = \left(\frac{1}{2}\right) 8^x$

b) $y = 8^{4x}$

c) $y = -8^x$

d) $y = 8^{-2x}$

5) Write the equation for the function that results from each transformation applied to the base function $y = 7^x$

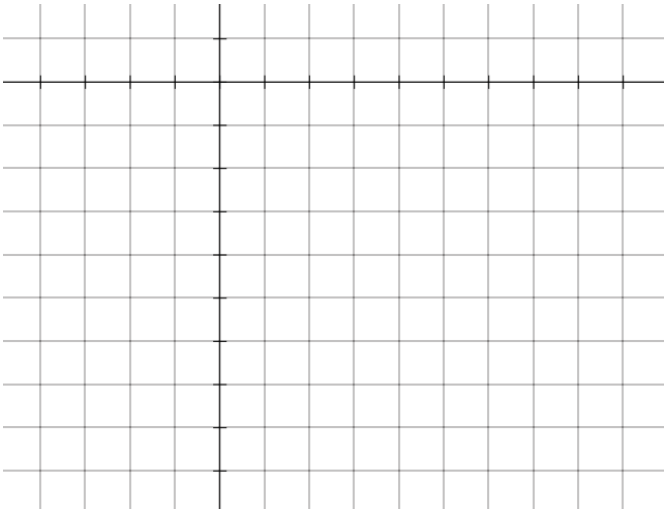
a) reflect in the x-axis (vertical reflection)

b) stretch vertically by a factor of 3

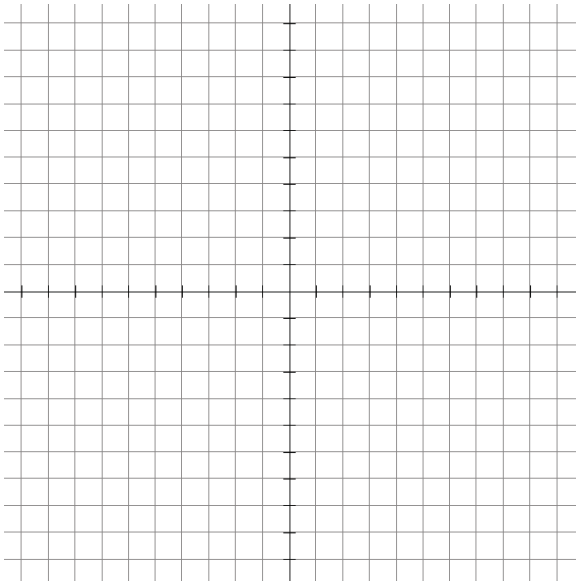
c) stretch horizontally by a factor of 2.4

d) reflect in the y-axis and stretch vertically by bafo 7

6) Sketch the graph of $y = \left(-\frac{1}{2}\right) 2^{x-4}$ by using $y = 2^x$ as the base and applying transformations.



7) Sketch the graph of $y = 3^{-0.5x-1} - 5$ by using $y = 3^x$ as the base and applying transformations.



8) a) Rewrite $y = 9^x$ using a base of 3. Describe how you can graph this function by transforming the graph of $y = 3^x$.

b) Rewrite $y = 9^x$ using a base of 81. Describe how you can graph this function by transforming the graph of $y = 81^x$.