

EXPONENTIAL FUNCTION TRANSFORMATIONS

Name: _____ Date: _____ Period: _____

EXPONENTIAL MODEL: $Y = A \cdot C^{B(X - H)} + K$ | **MAPPING RULE:** $(X, Y) \rightarrow (\frac{1}{C^B} X + H, A Y + K)$

Parent Function: $f(x) = 2^x$ | Horizontal Asymptote: $y = k$ | Key Anchor Points: $(-1, 0.5), (0, 1), (1, 2), (2, 4)$

PART 1: Vertical Shifts & Stretches — $y = a \cdot 2^x + k$

Problem 1: Graph $y = 3 \cdot 2^x - 5$

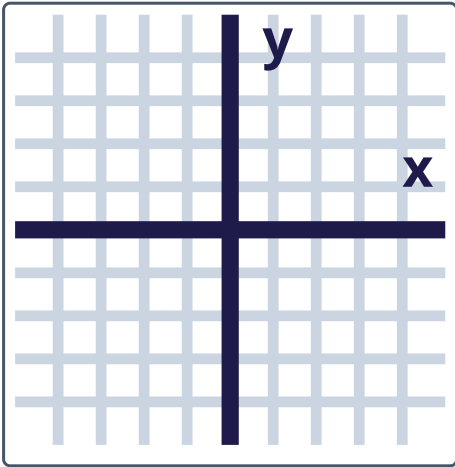
a. Horizontal Asymptote (HA): $y =$ _____

b. Y-intercept: $(0,$ _____ $)$

c. Mapping Rule: $(x, y) \rightarrow ($ _____ $,$
_____ $)$

d. Domain: _____ Range:

Parent x	-1	0	1	2
Parent $y = 2^x$	0.5	1	2	4
Transformed y				



PART 2: Horizontal Shifts & Reflections — $y = a \cdot 2^{b(x - h)}$

Problem 2: Graph $y = -2^{(x + 3)} + 2$

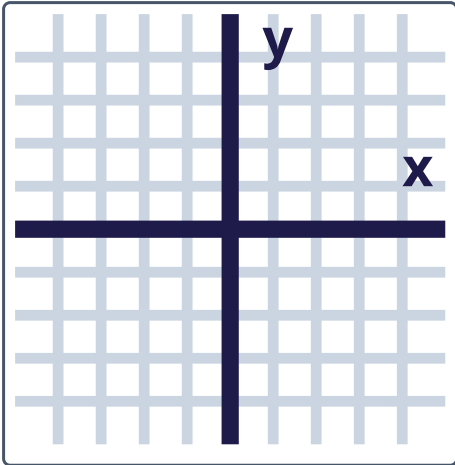
a. Reflection: ☐ Over x-axis ☐ Over y-axis

b. Horizontal Shift: _____

c. Horizontal Asymptote: $y =$ _____

d. Mapping Rule: $(x, y) \rightarrow ($ _____ $,$
_____ $)$

Parent (x, y)	$(-1, 0.5)$	$(0, 1)$	$(1, 2)$	$(2, 4)$
Transformed x				
Transformed y				



Problem 3: Graph $y = 2^{-(x-1)} - 3$

- a. Horizontal Asymptote: $y =$ _____
- b. Horizontal Reflection: _____
- c. Mapping Rule: $(x, y) \rightarrow ($ _____ , _____)
- d. Domain: _____ Range: _____

Parent x	-1	0	1	2
Transformed x				
Transformed y				

