

RPC Review
Exponential & Logarithmic Functions

Name KEY

Date _____ Period _____

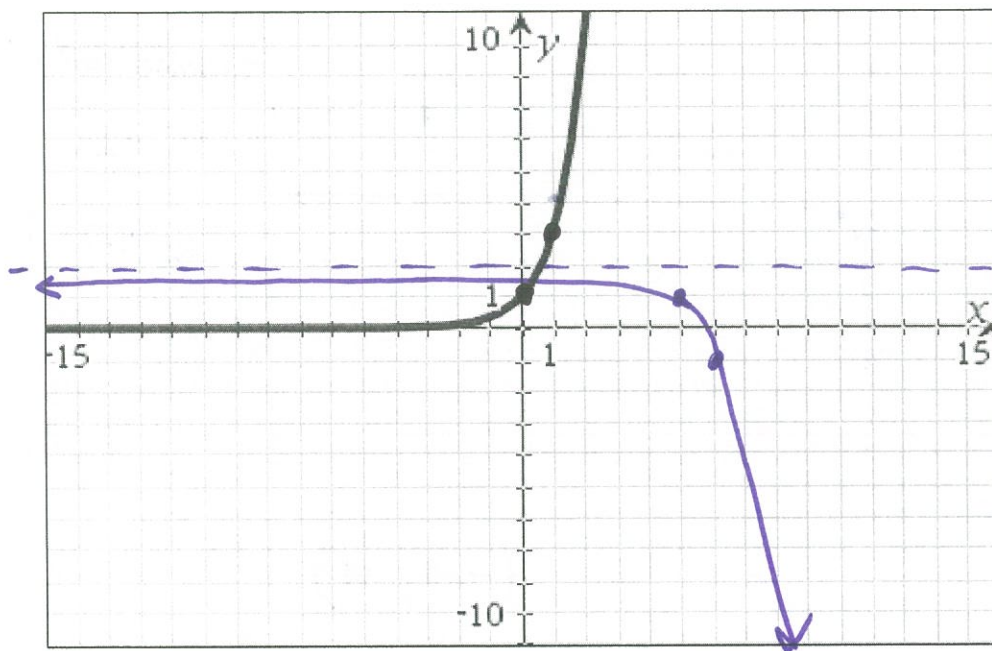
PC Reporting Strand: Exponential & Logarithmic Functions (Key Features and Transformations)

1. Given the original function, $f(x) = 3^x$ and the transformed function, $g(x) = -3^{x-5} + 2$ answer the questions below.

a) Describe the transformations that occur between $f(x)$ and $g(x)$.

Reflect over x
Right 5
up 2 } $(x+5, -y+2)$

b) Graph the transformed function below given the graph of $f(x)$.



original points:

$(0, 1)$

$(1, 3)$

transformed points:

$(5, 1)$

$(6, -1)$

c) Identify the key features of $g(x)$.

Domain: $(-\infty, \infty)$

Range: $(-\infty, 2)$

y-intercept: $(0, 1.99)$

Asymptote: $y = 2$

$$y = -3^{0-5} + 2 = -3^{-5} + 2 =$$

End Behavior: As $x \rightarrow -\infty$, $f(x) \rightarrow 2$

As $x \rightarrow \infty$, $f(x) \rightarrow -\infty$

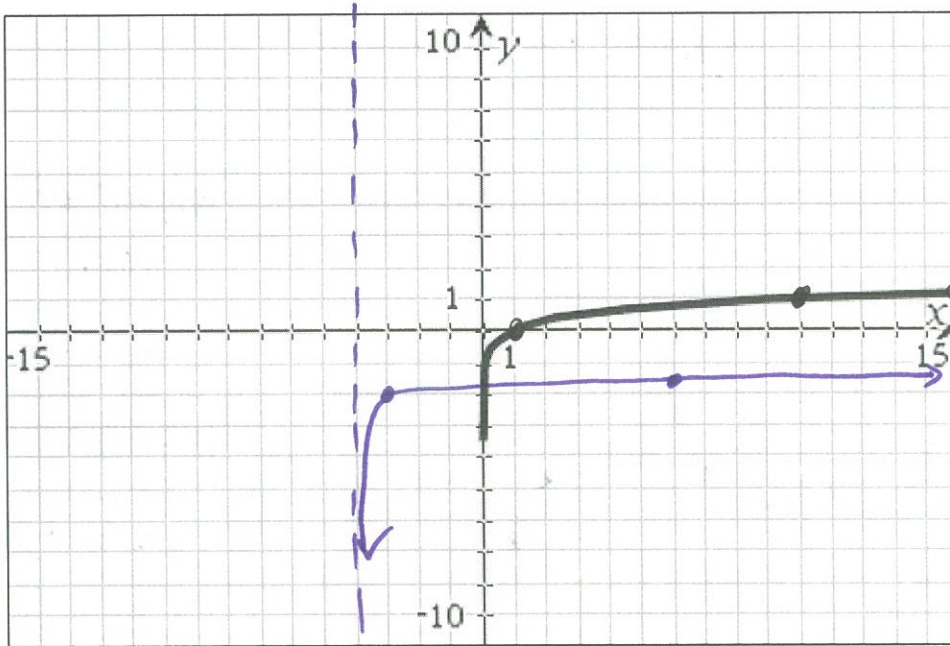
2. Given the original function, $f(x) = \log x$ and the transformed function, $g(x) = \frac{1}{4} \log(x + 4) - 2$ answer the questions below.

a) Describe the transformations that occur between $f(x)$ and $g(x)$.

Vertical shrink by $\frac{1}{4}$
 left 4
 Down 2

} $(x-4, \frac{1}{4}y-2)$

b) Graph the transformed function below given the graph of $f(x)$.



original points:

$(1, 0)$

$(10, 1)$

transformed points:

$(-3, -2)$

$(6, -1.75)$

c) Identify the key features of $g(x)$.

Domain: $(-4, \infty)$

Range: $(-\infty, \infty)$

y-intercept: -1.8

Asymptote: $x = -4$

End Behavior: As $x \rightarrow -4$, $f(x) \rightarrow -\infty$

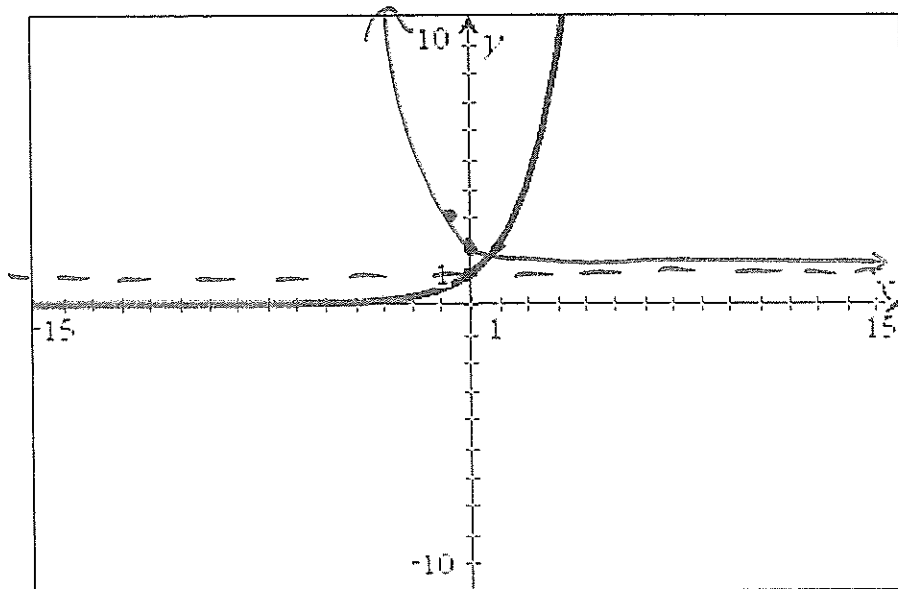
As $x \rightarrow \infty$, $f(x) \rightarrow \infty$

3. Given the original function, $f(x) = 2^x$ and the transformed function, $g(x) = 2^{-2x} + 1$ answer the questions below.

a) Describe the transformations that occur between $f(x)$ and $g(x)$.

Reflect over y
 Horiz. shrink by 2 } $(\frac{-x}{2}, y+1)$
 up 1

b) Graph the transformed function below given the graph of $f(x)$.



original points:

$(0, 1)$

$(1, 2)$

transformed points:

$(0, 2)$

$(-\frac{1}{2}, 3)$

c) Identify the key features of $g(x)$.

Domain: $(-\infty, \infty)$

Range: $(1, \infty)$

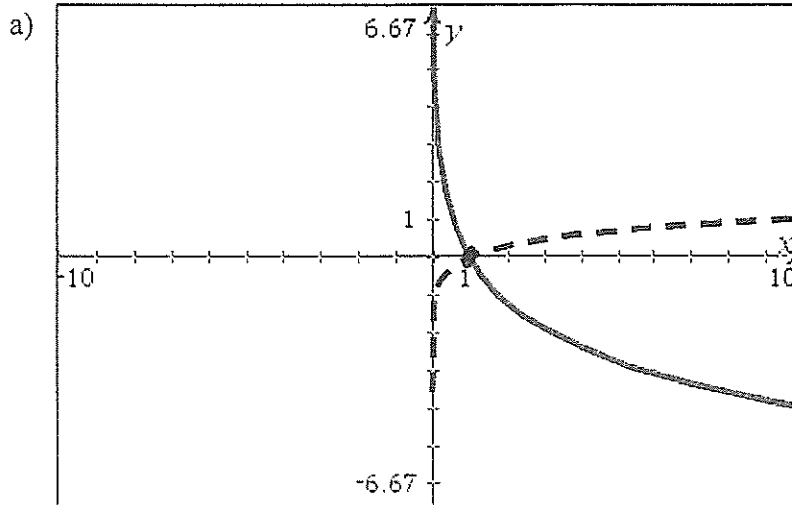
y-intercept: $(0, 2)$

Asymptote: $y = 1$

End Behavior: As $x \rightarrow -\infty$, $f(x) \rightarrow \infty$

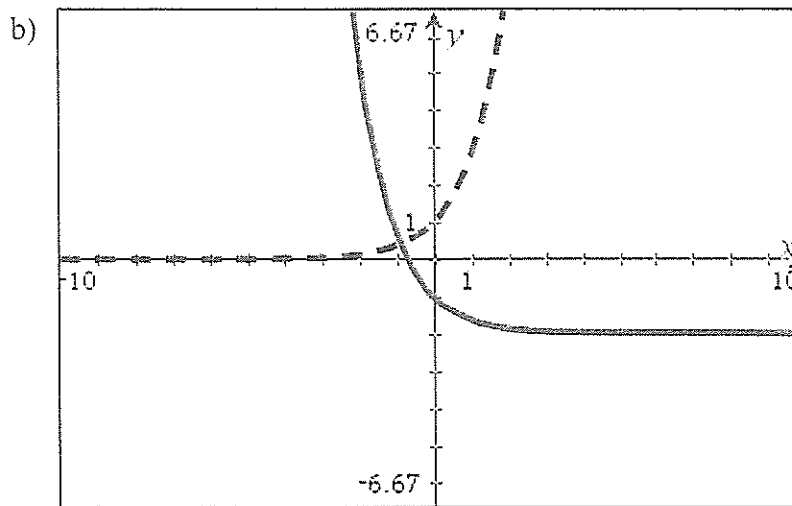
As $x \rightarrow \infty$, $f(x) \rightarrow 1$

3. Based on the graph of the original function (dashed lines) write an equation that represents the graph of the transformed function (bold lines).



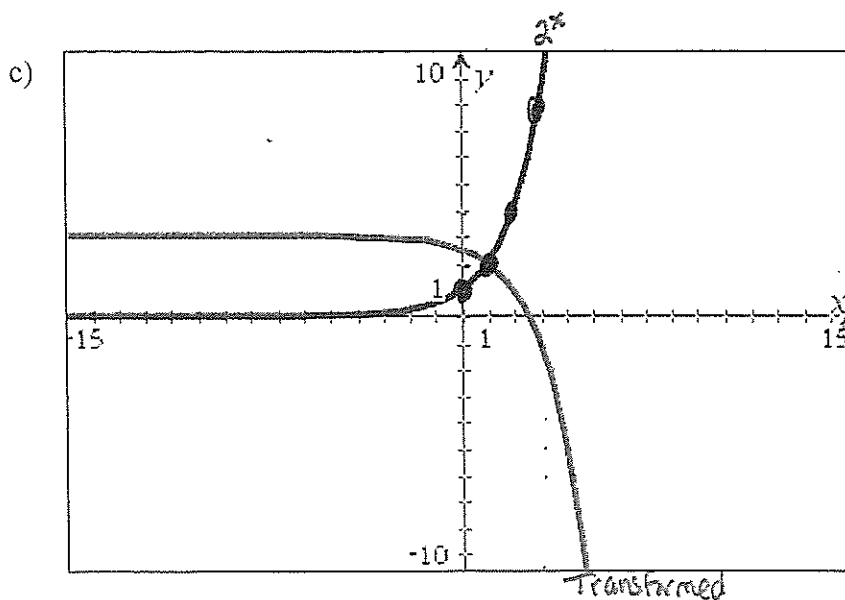
$f(x) = \log x$
 Reflect over x
 Vertical Stretch by 4

$$g(x) = \underline{-4 \log x}$$



$f(x) = e^x$
 Reflect over y
 Down 2

$$g(x) = \underline{e^{-x} - 2}$$



$f(x) = 2^x$
 Reflect over x
 up 3

~~Right 1~~ Horizontal Stretch by 1

$$g(x) = \underline{-2^{x-1} + 3}$$

$$\underline{-2^{x-1} + 3}$$