Graphing Logs, Natural Logs, and e Name:_____

Transformations: $f(x) = -\log_b(-x-h)+k$ ← up(+)/Down(-)

Reflect over X-axis; Reflect over y-axis; Left(+)/Right(-)

Examples:

1) $y = -\log_a(x-1)$

Reflect X-axis
Right 1

2) $y = \log_a(-x+3)$

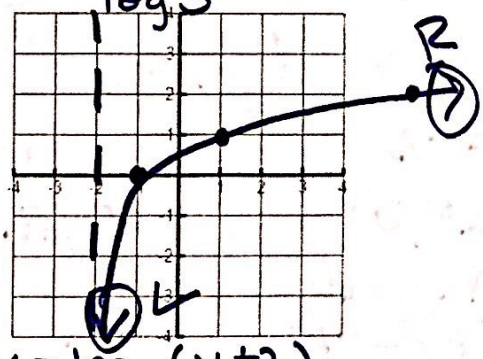
$y = \log_a -(x-3)$
Reflect y-axis
Right 3

3) $y = \log_a(-x) - 4$

Reflect y-axis
Down 4

4) $y = \log_3(x+2)$

$y = \frac{\log(x+2)}{\log 3}$



Transformations: Left 2

State 3 points on Graph_____

Domain $(-2,\infty)$ Range $(-\infty,\infty)$

Asymptote $X=-2$ (Increasing) or Decreasing

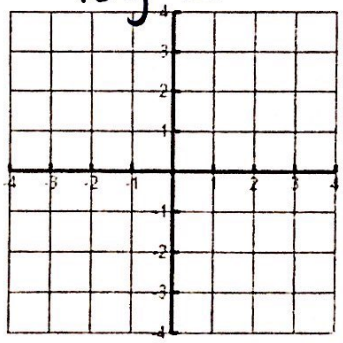
X-intercept $(-1,0)$ Y-intercept $(0,0.63093)$

End Behavior R $x \to \infty$, $f(x) \to \infty$
L $x \to -2$, $f(x) \to -\infty$

Inv: $x = \log_3(y+2)$
$3^x = y+2$
$3^x - 2 = y$

5) $y = \log_2(x+3) - 1$

$y = \frac{\log(x+3)}{\log 2} - 1$



Transformations: _____

State 3 points on Graph_____

Domain_____ Range_____

Asymptote_____ Increasing or Decreasing

X-intercept _____ Y-intercept _____

End Behavior $x \to$ _____, $f(x) \to$ _____
$x \to$ _____, $f(x) \to$ _____

Inv: $x = \log_2(y+3) - 1$
$x+1 = \log_2(y+3)$
$2^{x+1} = y+3$
$2^{x+1} - 3 = y$

Transformations: $f(x) = -e^{x-h} + k$ $f(x) = -\ln(-x-h) + k$

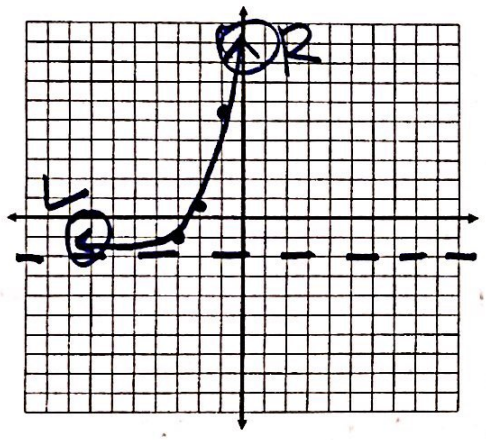
1) $g(x) = -3e^{x} + 2$
- Reflect x-axis
- Vertical Stretch of 3
- Up 2

2) $f(x) = 0.2e^{(x-2)}$
- Vertical Shrink of 0.2
- Right 2

3) $g(x) = 2\ln(x+3)$
- Vertical stretch of 2
- Left 3

4) $f(x) = -3\ln(x-1) + 4$
- Reflect x-axis
- Vertical Stretch of 3
- Right 1
- Up 4

5) $y = e^{x+3} - 2$



Transformations: Left 3, Down 2

State 3 points on Graph _____

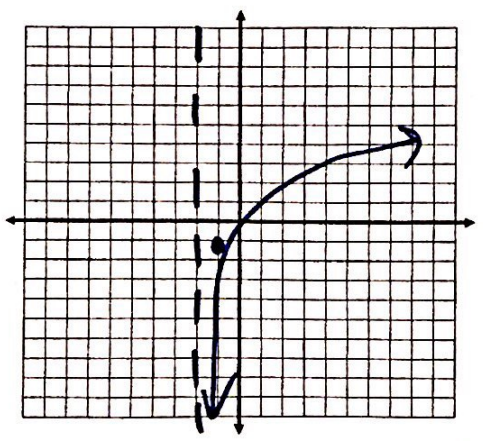
Domain $(-\infty, \infty)$ Range $(-2, \infty)$

Asymptote $y = -2$ (Increasing) or Decreasing

X-intercept $(-2.5, 0)$ Y-intercept $(0, 18.086)$

End Behavior
R $x \to \infty$, $f(x) \to \infty$
L $x \to -\infty$, $f(x) \to -2$

6) $y = \ln(x+2) - 1$



Transformations: _____

State 3 points on Graph _____

Domain _____ Range _____

Asymptote _____ Increasing or Decreasing

X-intercept _____ Y-intercept _____

End Behavior
$x \to$ _____, $f(x) \to$ _____
$x \to$ _____, $f(x) \to$ _____