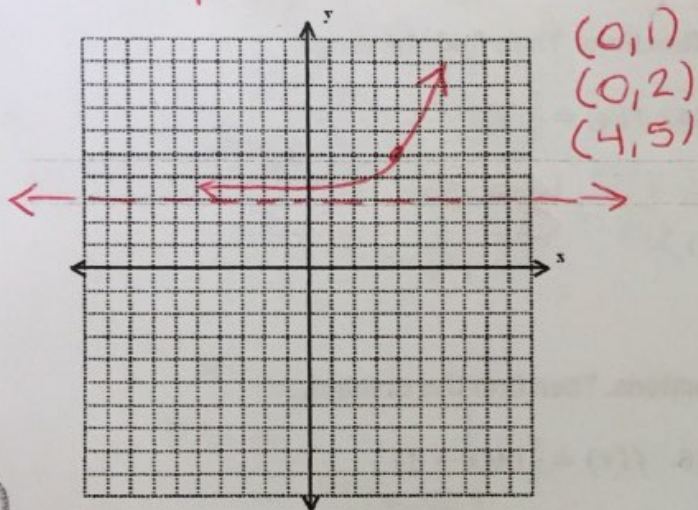## Graphs of Exponential Functions

Identify the transformations for each of the following functions. Graph the function.

1. $y = 2 \cdot e^{x-4} + 3$
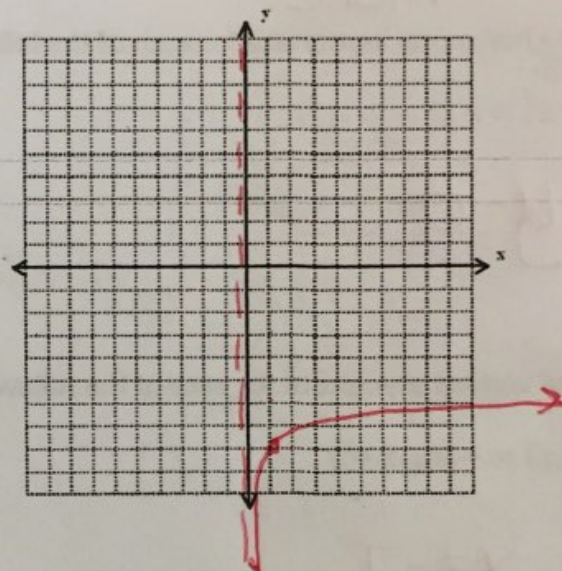
V.S by 2
right 4
up 3

H.A
$y = 3$

(0,1)
(0,2)
(4,5)

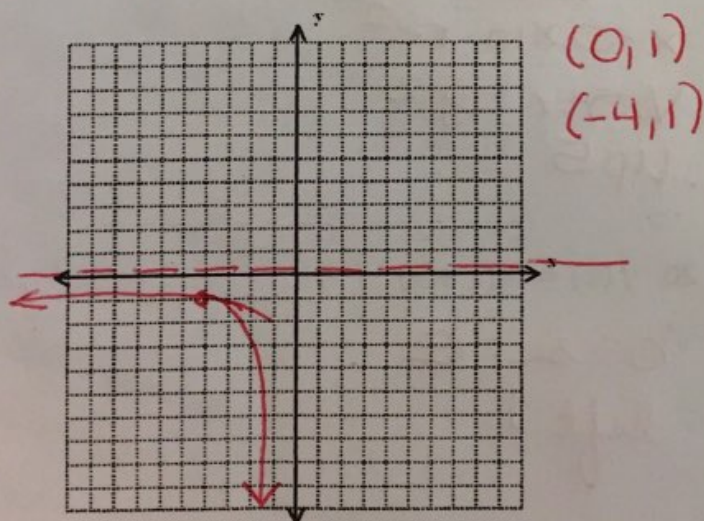2. $f(x) = \log_3 x - 8$

down 8
VA $x = 0$

(1,0)
(1,-8)

3. $y = -(3)^{x+4}$

x-axis ref
left 4

H.A $y = 0$

(0,1)
(-4,1)

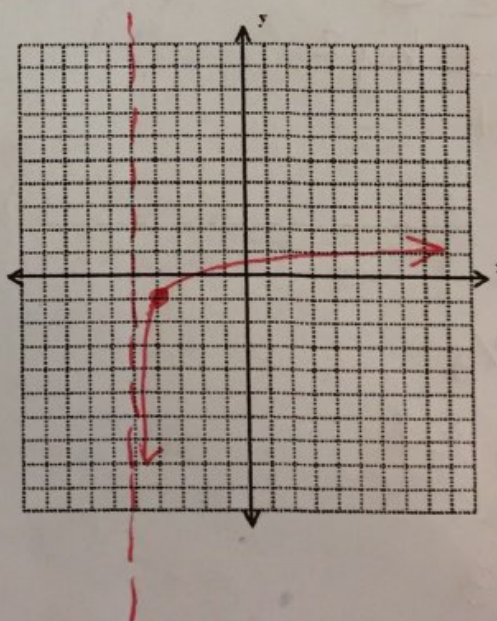4. $f(x) = \ln(x+5) - 1$

left 5
down 1

VA $x = -5$

(1,0)
(-4,-1)

Find the x- and y-intercepts.

9. $f(x) = 5^{x+1} - 2$

x-int
$2 = 5^{x+1}$
$\log_5(2) - 1 = x$

y-int
$y = 5 - 2$
$= 3$

10. $f(x) = \frac{1}{2} \cdot e^x$

x-int
$2 = e^x$
$\ln(2) = x$

y-int
$y = \frac{1}{2}$

11. $f(x) = \ln(x - 1) + 2$

x-int
$-2 = \ln(x-1)$
$e^{-2} + 1 = x$

y-int
$y = \ln(-1) + 2$
none

12. $f(x) = \frac{1}{2}\log_3 x$

x-int
$2 = \log_3 x$
$9 = x$

y-int
$y = \frac{1}{2}\log_3(0)$
none

Find the horizontal asymptote for each of the following functions. Then find the range.

13. $f(x) = -2^x - 7$

$\cancel{y = 0}$
$y = -7$

14. $f(x) = \frac{1}{3}(2)^{x-3}$

$\cancel{y = 3}$
$y = 0$

Find the vertical asymptote for each of the following functions. Then find the domain.

15. $f(x) = -\log_2 x - 7$

$\cancel{x = -7}$ $x = 0$

16. $f(x) = \frac{1}{3}\ln(x - 3)$

$\cancel{x = 0}$ $x = 3$

Identify the base. Then identify all of the transformations for each of the following functions.

17. $y = 2(e)^{x-4} + 3$

base: e
Vert st by 2
right 4
up 3

18. $y = -2\log_3 x + 5$

base 3
x-axis ref
V. str by 2
up 5

19. $f(x) = -\frac{1}{3}^{x+6} - 3$

base 1/3
x axis ref
left 6
down 3

20. $f(x) = \ln(x + 1)$

base: e
left 1