

Thursday, May 30, 2019
7:38 PM

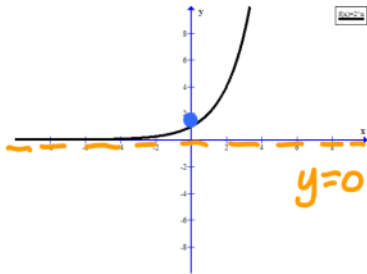
KEY

Precalculus – Chapter 3 - Base e and Natural Log graphs

(Day 1)

Do Now: State the following for each graph:

1. $p(x) = 2^x$



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

Range: $(0, \infty)$

x-int.: none

y-int.: $(0, 1)$

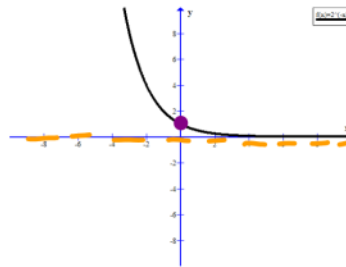
Horizontal Asymptote:
 $y = 0$

Vertical Asymptote:
none

Classwork:

1. $f(x) = e^x$

2. $g(x) = 2^{-x}$



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

Range: $(0, \infty)$

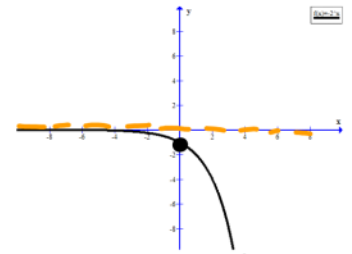
x-int.: none

y-int.: $(0, 1)$

Horizontal Asymptote:
 $y = 0$

Vertical Asymptote:
none

3. $h(x) = -2^x$



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

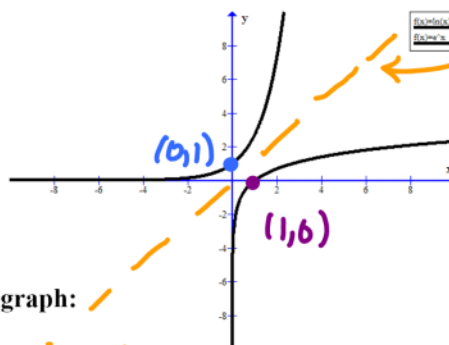
Range: $(-\infty, 0)$

x-int.: none

y-int.: $(0, -1)$

Horizontal Asymptote:
 $y = 0$

Vertical Asymptote:
none



Reflection over $y = x$

2. $g(x) = \ln x$

$\log_e x$

\neq inverse functions

State the following for each graph:

Domain:

$f(x)$: $(-\infty, \infty)$

$g(x)$: $(0, \infty)$

Horizontal Asymptote:

$f(x)$: $y = 0$

$g(x)$: none

Range:

$(0, \infty)$

$(-\infty, \infty)$

Vertical Asymptote:

none

$x = 0$

x-int.:

none

$(1, 0)$

y-int.:

$(0, 1)$

none

Sketch the following:

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

$f(x) = e^x$

| ① $x-3$ | x | y | ② $y-4$ |
|------------|-----|-----|------------|
| -3 | 0 | 1 | -3 |
| -2 | 1 | 2.7 | -1.3 |

x
 y

Transformations: ① left 3 units
② down 4 units

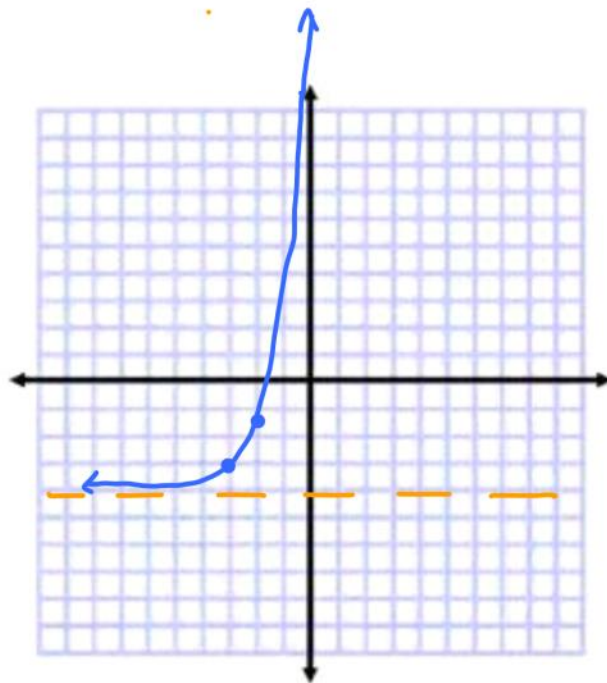
Domain: $(-\infty, \infty)$

Range: $(-4, \infty)$

x-int: skip

y-int: $f(0) = e^{0+3} - 4 = (0, 16.09)$

Asymptote: $y = -4$



$f(x) = e^x$

4. $g(x) = e^{-6x}$.

| ② $\frac{1}{6}x$ | ① $(-1)x$ | x | y |
|---------------------|--------------|-----|-----|
| 0 | 0 | 0 | 1 |
| $-\frac{1}{6}$ | -1 | 1 | 2.7 |

x
 y

Transformations: ① Reflect over y axis ② Horiz compress - factor of $\frac{1}{6}$

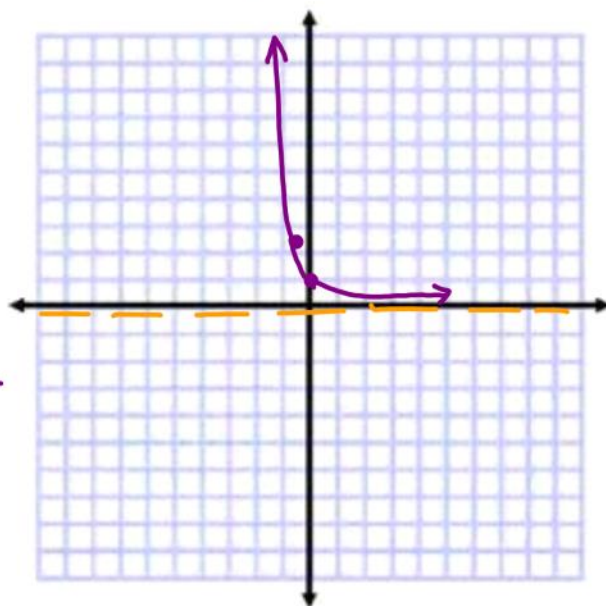
Domain: $(-\infty, \infty)$

Range: $(0, \infty)$

x-int: none

y-int: $(0, 1)$

Asymptote: $y = 0$



$\ln x = \log_e x = y$
 $x e^y = x$

5. $h(x) = \ln(x+6) + 2$

$p(x) = \ln x$

| $x-6$ | X | Y | $y+2$ |
|-------|-----|---|-------|
| -5 | 1 | 0 | 2 |
| -3.3 | 2.7 | 1 | 3 |

Transformations:
 ① Shift 6 left ② Shift 2 up

Domain: $(-6, \infty)$

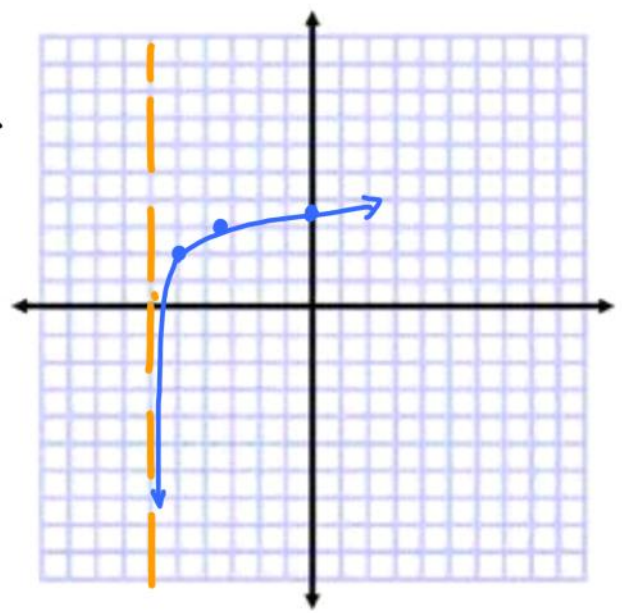
Range: $(-\infty, \infty)$

x-int: skip $(0, 3.8)$

y-int: $f(0) = \ln(0+6) + 2 = 3.8$

Asymptote: $x = -6$

* Switch forms!



6. $j(x) = 3 \ln(2x-4)$

* FACTOR!
 $3 \ln(2(x-2))$

$P(x) = \ln x$ switch forms!
 $e^y = x$

| $x+2$ | $\frac{1}{2}x$ | X | Y | $3y$ |
|-------|----------------|-----|---|------|
| 2.5 | $\frac{1}{2}$ | 1 | 0 | 0 |
| 3.35 | 1.35 | 2.7 | 1 | 3 |

Transformations:
 ① Horiz compress, factor of $\frac{1}{2}$ ② Shift 2 Rt

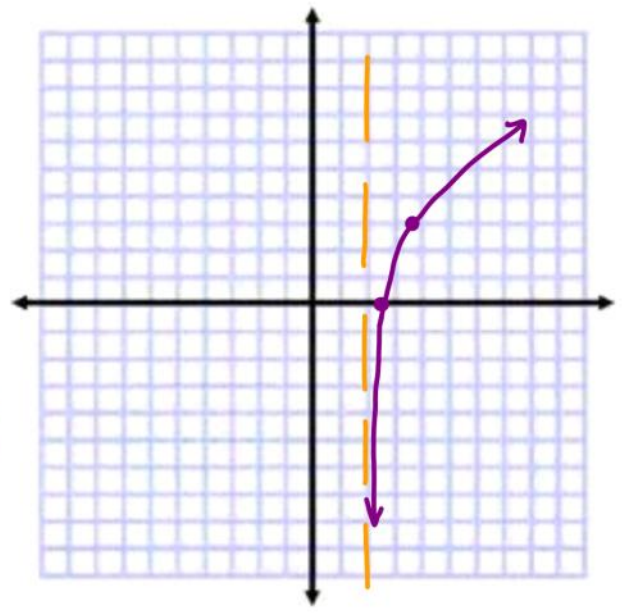
Domain: $(2, \infty)$ ③ Vertical stretch factor of 3

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

x-int: $(2.5, 0)$

y-int: none

Asymptote: $x = 2$



7. $g(x) = \log_e x + 1$.

Transformations:

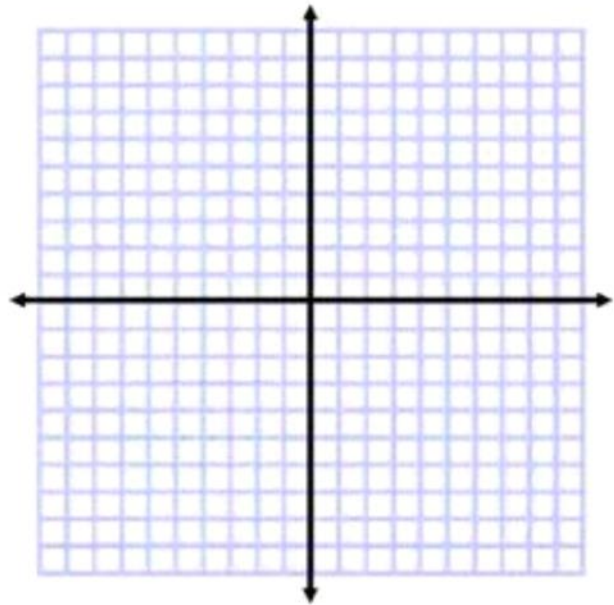
Domain:

Range:

x-int:

y-int:

Asymptote:



8. $k(x) = \log_e (4x - 16) - 2$.

Transformations:

Domain:

Range:

x-int:

y-int:

Asymptote:

