

~~Graph the following functions~~

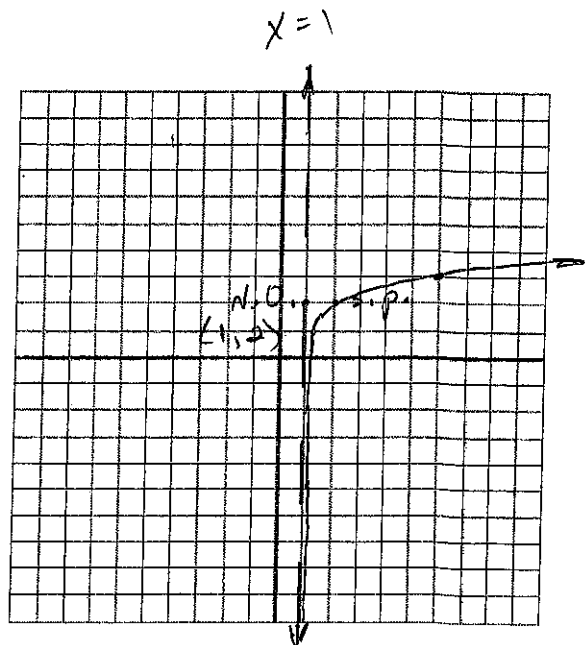
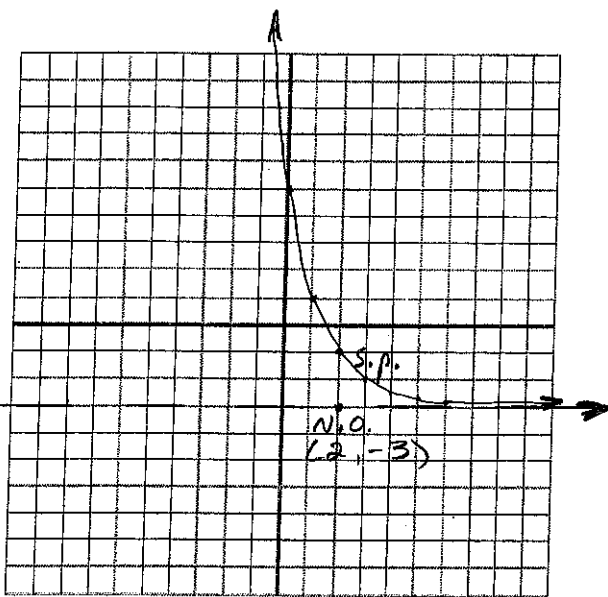
~~11. $f(x) = \dots$~~

~~12. $f(x) = \dots$~~

Graph the following functions and describe the domain and range.

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

14. $f(x) = \log_5(x-1) + 2$



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

Domain: $(1, \infty)$

Range: $(-3, \infty)$

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

$a = 2$ $h = 2$
 $b = \frac{1}{2}$ $y = k = -3$

$b = 5$ $x = h = 1$
 $c = 1$ $k = 2$ N.O. (1, 2)

Transformations N.O. (2, -3)

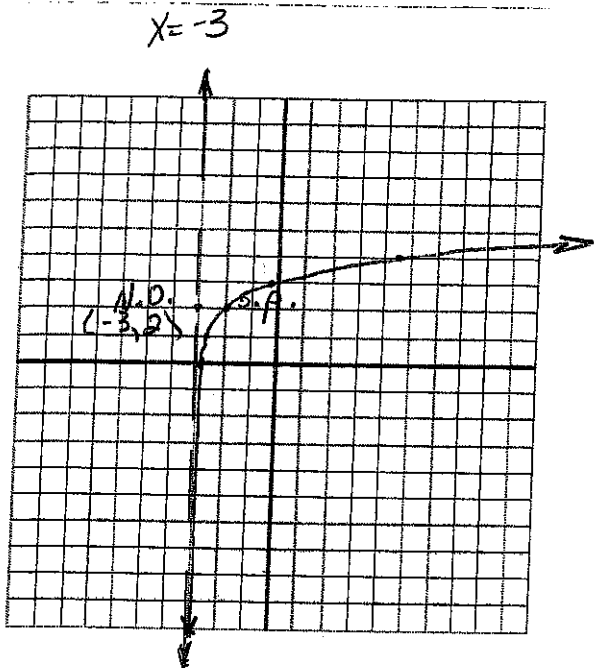
Transformations

Vertical stretch of 2
Translates right 2 units
Translates down 3 units

translates right 1 unit
translates up 2 units

Graph the following functions and describe the domain and range.

15. $f(x) = \ln(x+3) + 2$



Domain: $(-3, \infty)$

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

$b = e \quad x = h = -3$

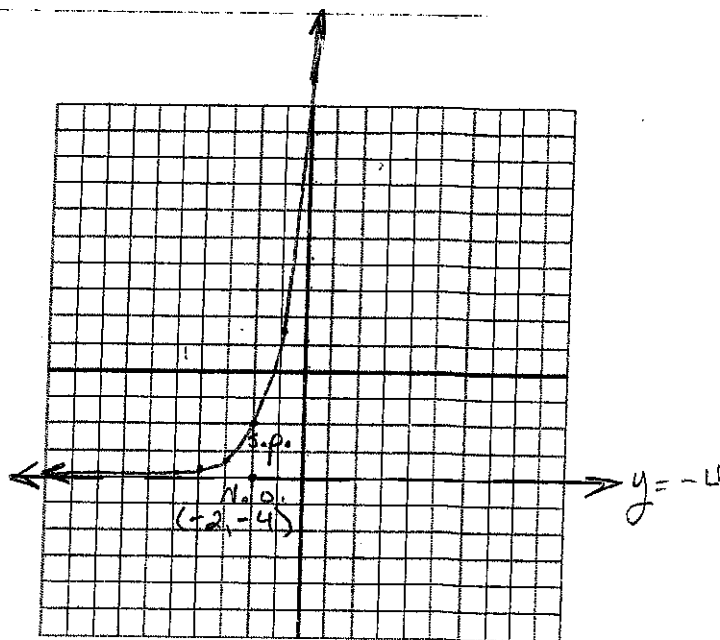
$c = 1 \quad k = 2$

N.O. $(-3, 2)$

Transformations

translates left 3 units
translates up 2 units

16. $f(x) = 2e^{x+2} - 4$



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

Range: $(-4, \infty)$

$a = 2 \quad h = -2$

$b = e \quad y = k = -4$

N.O. $(-2, -4)$

Transformations

Vertical stretch of 2
Translates left 2 units
Translates down 4 units

04/24/2019

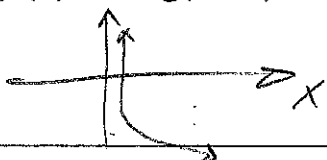
Find the asymptote for each function.

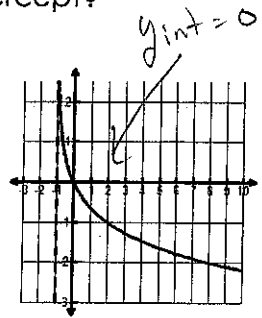
<p>1. $f(x) = -3^{x-2} + 7$ What is the asymptote for the given function? $y = 7$</p>	<p>2. $f(x) = 6^{x-2} + 7$ What is the asymptote for the given function? $y = 7$</p>
<p>3. $f(x) = \ln(x+1) - 4$ What is the asymptote for the given function? $x = -1$</p>	<p>4. $f(x) = -\log(x-7) + 2$ What is the asymptote for the given function? $x = 7$</p>

Describe the Transformation in each function

<p>5. $f(x) = \ln(x+4) - 1$ What are the transformations for the given function? translates left 4 units translates down 1 unit</p>	<p>6. $f(x) = -\log(x-7) + 2$ What are the transformations for the given function? Reflection across x-axis translates right 7 units translates up 2 units</p>
<p>7. $f(x) = 3(2)^{x-3} + 4$ What are the transformations for the given function? Vertical stretch of 3 translates right 3 units translates up 4 units</p>	<p>8. $f(x) = 5^{-x+3} - 2 = 5^{-1(x-3)} - 2$ What are the transformations for the given function? reflection across y-axis translates right 3 units translates down 2 units</p>

State whether the function is increasing or decreasing

<p>$f(x) = \left(\frac{1}{4}\right)^{x+5}$ a. increasing b. decreasing</p>	<p>$f(x) = -\log(x-7) + 2$ a. increasing b. decreasing</p> 
---	--

<p>9. Which has a larger y-intercept?</p> <table border="1"> <thead> <tr> <th>X</th> <th>F(x)</th> </tr> </thead> <tbody> <tr> <td>-2</td> <td>-1</td> </tr> <tr> <td>-1</td> <td>-1.58</td> </tr> <tr> <td>0</td> <td>-2</td> </tr> <tr> <td>1</td> <td>-2.32</td> </tr> <tr> <td>2</td> <td>-2.58</td> </tr> <tr> <td>3</td> <td>-2.81</td> </tr> <tr> <td>4</td> <td>-3</td> </tr> </tbody> </table>  <p>a. table b. graph</p>	X	F(x)	-2	-1	-1	-1.58	0	-2	1	-2.32	2	-2.58	3	-2.81	4	-3	<p>10. Is the table below an exponential function or a logarithmic function? a. exponential b. logarithmic</p> <p>11. What is the equation of the asymptote?</p> <table border="1"> <thead> <tr> <th>X</th> <th>F(x)</th> </tr> </thead> <tbody> <tr> <td>-5</td> <td>.11</td> </tr> <tr> <td>-4</td> <td>.33</td> </tr> <tr> <td>-3</td> <td>1</td> </tr> <tr> <td>-2</td> <td>3</td> </tr> <tr> <td>-1</td> <td>9</td> </tr> <tr> <td>0</td> <td>12</td> </tr> </tbody> </table> <p>asymptote $y = 0$ $f(x) = 3^{(x+3)}$</p>	X	F(x)	-5	.11	-4	.33	-3	1	-2	3	-1	9	0	12
X	F(x)																														
-2	-1																														
-1	-1.58																														
0	-2																														
1	-2.32																														
2	-2.58																														
3	-2.81																														
4	-3																														
X	F(x)																														
-5	.11																														
-4	.33																														
-3	1																														
-2	3																														
-1	9																														
0	12																														

5B Exp. And Log Graphing

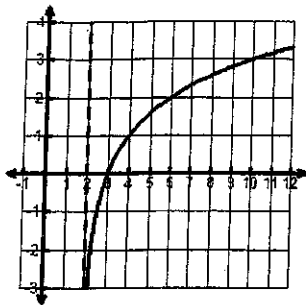
TEST REVIEW

Name: _____

12. Is the function exponential or logarithmic?

- a. exponential b. logarithmic

13. What is the equation of the asymptote?

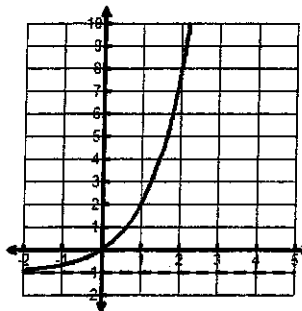


$x = 2$

14. Is the function exponential or logarithmic?

- a. exponential b. logarithmic

15. What is range for the function?



$R: (-1, \infty)$

16. Is the table below an exponential function or a logarithmic function?

- a. exponential b. logarithmic

17. What is the equation of the asymptote?

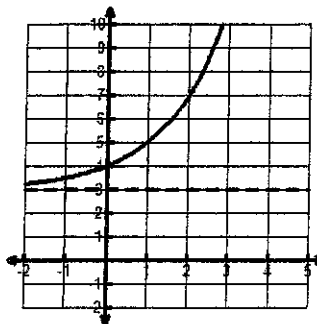
X	F(x)
2.33	-3
3	-2
4	-1
5	0
6	1

Omit

18. What is the domain for the function?

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

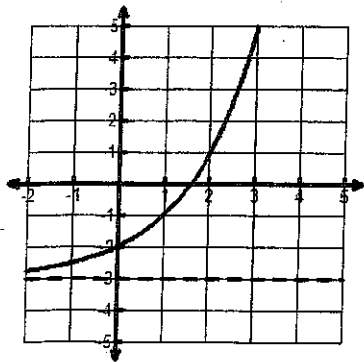
19. What is the end behavior for the function?



as $x \rightarrow \infty$; $f(x) \rightarrow \infty$
as $x \rightarrow -\infty$; $f(x) \rightarrow 3$

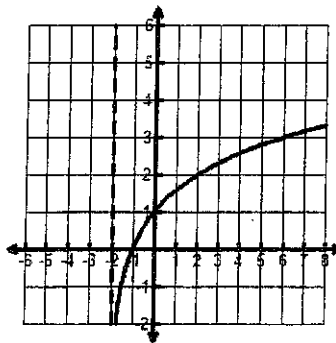
Determine the end behavior of the graphs below.

20.



$x \rightarrow \infty, f(x) \rightarrow \infty$
 $x \rightarrow -\infty, f(x) \rightarrow -3$

21.



$x \rightarrow \infty, f(x) \rightarrow \infty$
 $x \rightarrow -2, f(x) \rightarrow -\infty$

5B Exp. And Log Graphing
TEST REVIEW

Graph the functions below

Name: Solution Key
04/24/2019

22. $y = 5^x - 3$

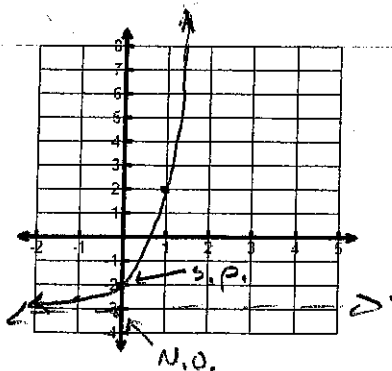
N.O. $(0, -3)$

$0 = 5^x - 3$

$5^x = 3$

$\log_5 5^x = \log_5 3$

$x = \frac{\ln 3}{\ln 5}$



State 3 points on Graph $(0, -2), (1, 2), (3, 22)$

Asymptote $y = -3$

X-intercept $\frac{\ln 3}{\ln 5} = 0.68$ Y-intercept $y = -2$

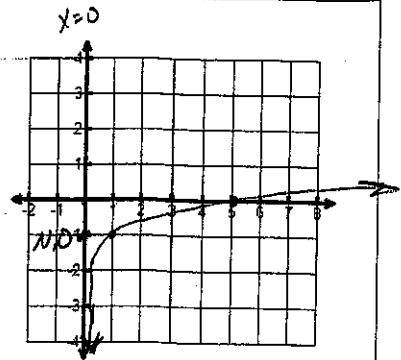
$x \rightarrow \infty, f(x) \rightarrow \infty$

End Behavior: $x \rightarrow -\infty, f(x) \rightarrow -3$

Domain $(-\infty, \infty)$ Range $(-3, \infty)$

23. $y = \log_5(x) - 1$

$b=5 \quad h=0$
 $c=1 \quad k=-1$
N.O. $(0, -1)$



State 3 points on Graph $(25, 1), (5, 0), (1, -1)$

Asymptote $x = 0$

X-intercept $x = 5$ Y-intercept NONE

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

End Behavior: $x \rightarrow 0, f(x) \rightarrow -\infty$

Domain $(0, \infty)$ Range $(-\infty, \infty)$

Use the table of values to describe the characteristics for the natural log and e^x functions.

24. $y = \ln(x-2)$

Asymptote $x = 2$ Inc or Dec

X-intercept $x = 3$ Y-intercept $\ln 2 = .693$

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

25. $y = e^{x+1} - 3$

Asymptote $y = -3$ Inc or Dec
 $= 0.099$

X-intercept $x = -1 + \ln 3$ Y-intercept $y = -0.28$

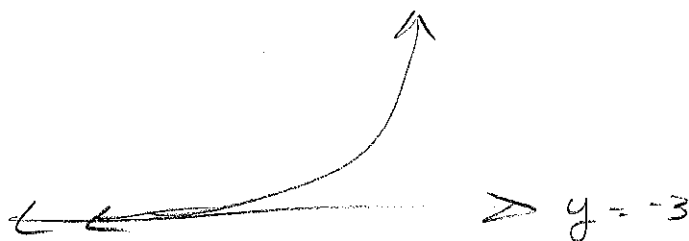
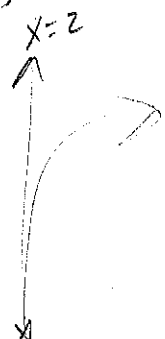
Domain $(-\infty, \infty)$ Range $(-3, \infty)$

$0 = \ln(x-2)$

$e^0 = e^{\ln(x-2)}$

$1 = x-2$

$x = 3$



$0 = e^{x+1} - 3$

$e^{x+1} = 3$

$\ln e^{x+1} = \ln 3$

$x+1 = \ln 3$

$x = -1 + \ln 3$

$$A = P(1+r)^t \quad A = P(1-r)^t \quad A = P\left(1 + \frac{r}{n}\right)^{nt} \quad A = Pe^{rt}$$

26. You purchase a car for \$20,000. The value of the car decreases 12% each year.

$$a = \$20000 \quad r = 12\% \text{ decrease / yr.}$$

a. Write the equation for the car's value in terms of the number of years since the purchase.

$$y = a(1-r)^t$$

$$y = \$20000(1-0.12)^t, \text{ so } y = \$20000(0.88)^t$$

b. What is the value of the car after 5 years?

$$y = \$20000(0.88)^5$$

$$y = \$20000(0.88)^5$$

$$y = \$1,055.46$$

c. When will the car be worth half the original value?

$$y = \$10000, \text{ so } \$10000 = \$20000(0.88)^t$$

$$0.5 = 0.88^t$$

$$\log_{0.88} 0.5 = \log_{0.88} 0.88^t$$

$$t = \frac{\log_{0.88} 0.5}{\log_{0.88} 0.88} = \frac{\ln 0.5}{\ln 0.88} = 5.4 \text{ yrs}$$

27. You deposit \$3000 in an account that earns 2.5% annual interest. Find the balance after 10 years if the interest is compounded:

$$a = \$3000 \quad r = 2.5\% \text{ annual} \quad t = 10 \text{ yrs}$$

a. Semi-Annually $n=2$

$$y = a\left(1 + \frac{r}{n}\right)^{nt}$$

$$y = \$3000\left(1 + \frac{0.025}{2}\right)^{2(10)} = \$3846.11$$

b. Quarterly $n=4$

$$y = a\left(1 + \frac{r}{n}\right)^{nt}$$

$$y = \$3000\left(1 + \frac{0.025}{4}\right)^{4(10)} = \$3849.08$$

c. Continuously

$$y = Pe^{rt}$$

$$y = \$3000e^{0.025(10)} = \$3852.08$$

d. How long would it take to double your investment if it is compounded continuously?

$$y = \$6000, \text{ so } \$6000 = \$3000e^{0.025t}$$

$$2 = e^{0.025t}$$

$$\ln 2 = \ln e^{0.025t}$$

$$0.025t = \ln 2$$

$$t = \frac{\ln 2}{0.025} = 27.7 \text{ yrs}$$