

Version A

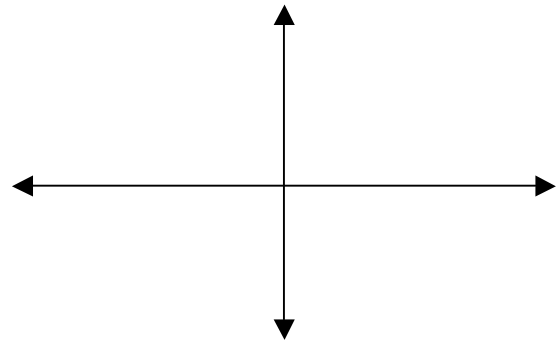
Directions. Show all work. Circle final answers.

1. Evaluate the following exponential expressions with your calculator.

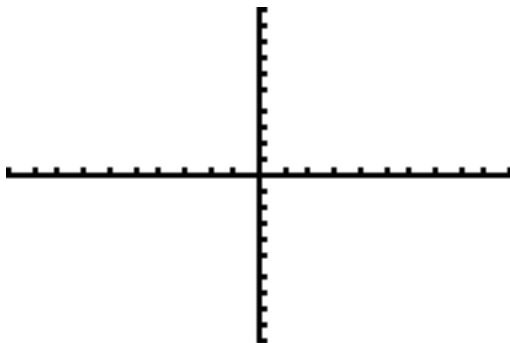
2^{e+1} (Give 3 decimal places)

2. **Describe** the transformation that occurs in the function. Remember to find the basic function first. Also sketch the graph.
 $f(x) = e^{x+1} + 5$

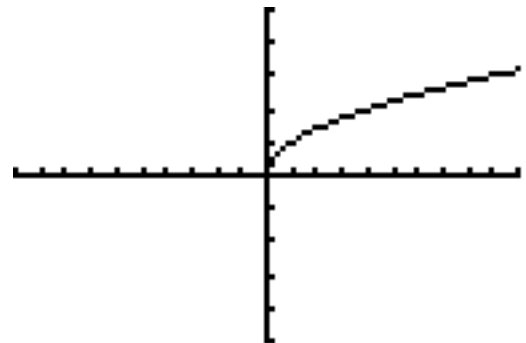
Description: _____



3. Graph $f(x) = -3^{x+3} + 5$



4. State the domain and range for the following graph.



D = _____ R = _____

5. Use a calculator to evaluate the expression.

$10^{\sqrt{7}}$ = _____

6. Rewrite in exponential form.

$\log_b(s + t) = r$

7. Rewrite in logarithmic form.

$$b^k = j$$

9. What is a natural logarithm ?

8. What is a common logarithm ?

10. Evaluate with a Calculator.

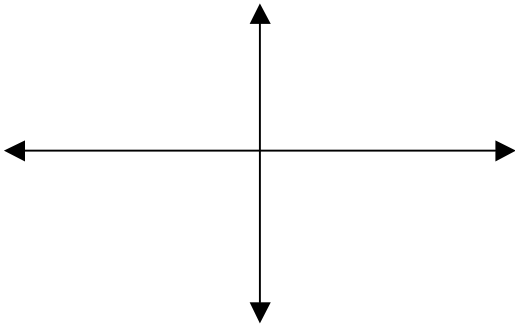
$$\ln(1.75)$$

11. Graph by using its exponential form.
You must do the problem this way!

12. Find the domain of the function.

$$f(x) = \log_{12} x \quad (\text{hint: use a t-table})$$

$$\log_{2/3}(11 - x)$$

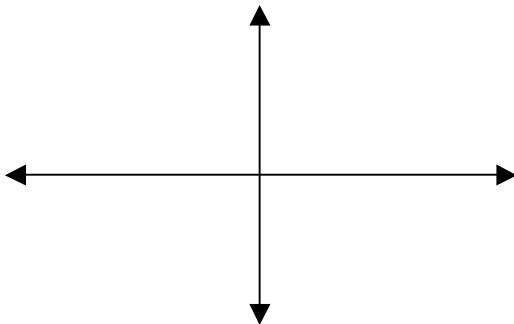
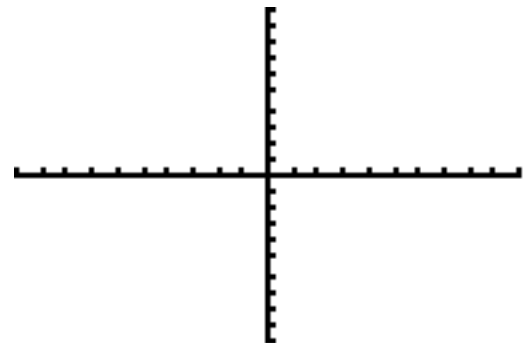


13. **Describe** the transformation that occurs in the function. Remember to find the basic function first. Also sketch the graph.

14. Graph $f(x) = \log_3(-x) + 2$

$$f(x) = 2 - \ln(x - 5)$$

Description: _____



15. What are the four properties of the graph of $f(x) = \log_b x$ that we discussed in class?

16. Solve $\left(\frac{1}{2}\right)^x = 32$

17. A total of \$15,800 is invested at an annual interest rate of 6.5%. Find the balance after 3 years if it is compounded:

a) daily.

b) continuously.

18. Find the following using your calculator.
hint: use change-of- base formula.
Give three decimal places.

$$\log_8 15$$

19. Find the following using your calculator.
hint: use change-of- base formula.
Give three decimal places.

$$\ln_3 127$$

20. Rewrite the logarithm in terms of
 $\ln 2$ and $\ln 7$.

$$\ln \frac{2}{49}$$

21. Rewrite in condensed form.

$$\frac{1}{3}[\log_2 x + \log_2(x + 1)]$$

Solve the following exponential or logarithmic equations. SHOW YOUR WORK !
Don't forget some of these have answers that have to be checked.

22. $3^x = 243$

23. $8^x = 42$

Solve the following exponential or logarithmic equations. SHOW YOUR WORK !
Don't forget some of these have answers that have to be checked (#5 - #10)

24. $3^{2x} = 80$

25. $\ln 2x = 2.4$

26. $\log_5 x + \log(x - 1) = 2$

27. $2\log_5 3x = 4$


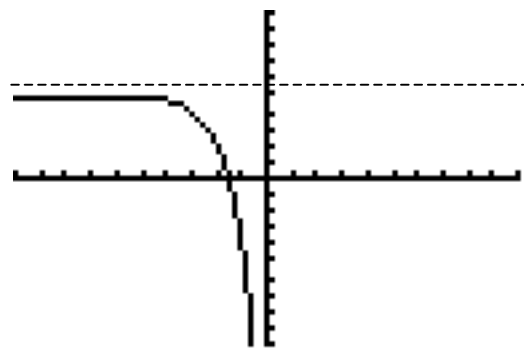
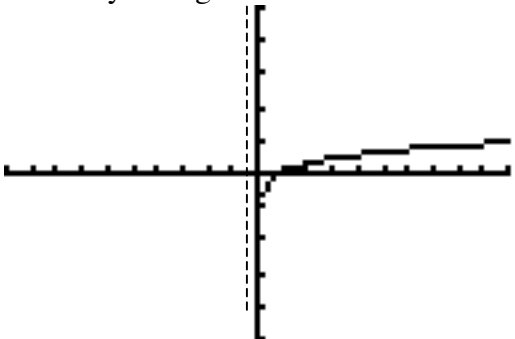
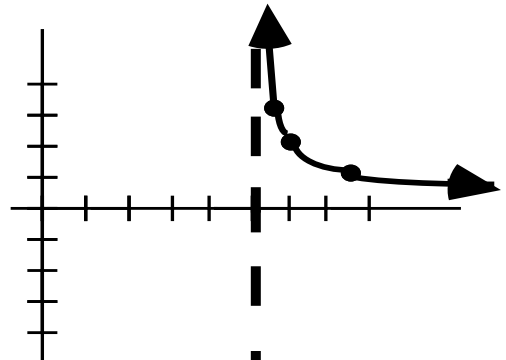
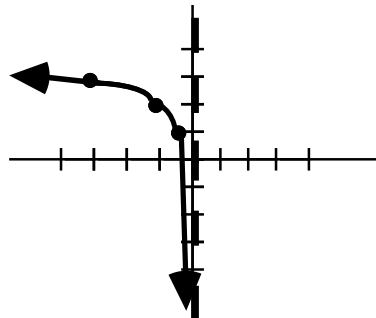
28. For a savings account with a initial investment of \$1000 and an annual rate of 12% in which interest is compounded continuously find

- a) The amount of time it takes to double the amount. b) The amount after saving for 10 years.

29. For the radioactive isotope ^{14}C with half-life of 5730 (years) find the initial amount if there are 2 grams left after 1000 years. (Hint first find the rate of decay.)

30. The population in Texas (in thousands) from 1991 to 2000 can be modeled by $P = 16,968e^{0.019t}$ where $t = 1$ represents the year 1991. According to this model, when will the population reach 22 million?

Answers Sample Test 1

<p>1. 13.16177198</p>	
<p>2. Looks like e^x shifted left 1 unit and up 5 units.</p> 	<p>3.</p> 
<p>4. $D = [0, \infty)$ $R = [0, \infty)$</p>	<p>5. 442.3350067</p>
<p>6. $b^r = (s + t)$</p>	<p>7. $\log_b j = k$</p>
<p>8. A logarithm that has base 10.</p>	<p>9. A logarithm that has base e (2.71828...).</p>
<p>10. .5596157879</p>	
<p>11. Choose y then get x value.</p> 	<p>12. Domain = $(-\infty, 11)$</p>
<p>13. Looks like $\ln x$ shifted right 5 units, reflected over the x-axis and shifted up 2 units.</p> 	<p>14.</p> 

15. 1) The point (1, 0) is on the graph. 2) If $a > 1$, f is an increasing function; If $0 < a < 1$, f is a decreasing function. 3) The y-axis is a vertical asymptote. 4) The domain is $(0, \infty)$ and the range is $(-\infty, \infty)$.	16. $x = -5$
17a) \$19,201.58	17b) \$19,201.91
18. ≈ 1.302	23. $x = \frac{\ln 42}{\ln 8} \approx 1.797$
19. ≈ 4.409	24. $\frac{\ln 80}{2 \ln 3} \approx 1.994$
20. $\ln 2 - 2 \ln 7$	25. $\frac{e^{2.4}}{2} \approx 5.512$
21. $\log_2 \sqrt[3]{x(x+1)}$	26. $x = 5$ (only solution)
22. $x = 5$	27. $x = \frac{25}{3}$
28. a) 5.78 years b) \$3320.12	29. rate of decay $k = (\ln 0.5)/5730$ after 1000 years about 2.26 grams are left.
30. $t \approx 13.7$ years which is the later half of the year 2003.	