Math 1111   Sample Test 4   Name _____

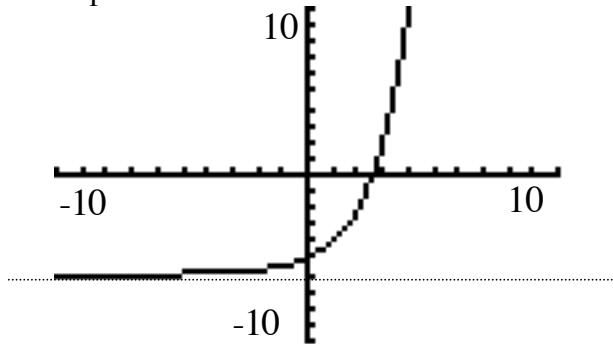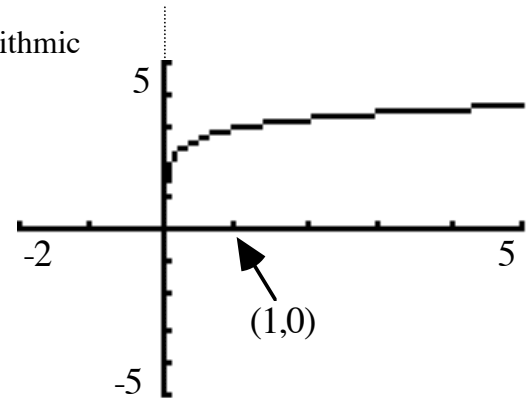5.1 - 5.5   Date _____

Use stretching/shrinking, reflecting and shifting rules to give an equation of the following graphs. Note: there may be more than one answer for these.

1.   Exponential

Answer _____

2.   Logarithmic

(1,0)

Answer _____

Rewrite the logarithm in terms of ln 2 and ln 7.

3.   ln 14

4. $\ln \dfrac{2}{49}$

Rewrite using the properties of logarithms.

5. $\log_2 \dfrac{\sqrt{a-1}}{9}$

6. $\ln\ xyz^2$

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

7. $\left(\dfrac{1}{3}\right)^{x} = 81$

8. $\log_4 x = 3$

9. $\left(\dfrac{3}{2}\right)^{x+1} = \left(\dfrac{8}{27}\right)^{x}$

10. $8^{x} = 42$

11. $\log_2 \frac{1}{8} = x$

12. $\ln 3x = 4$

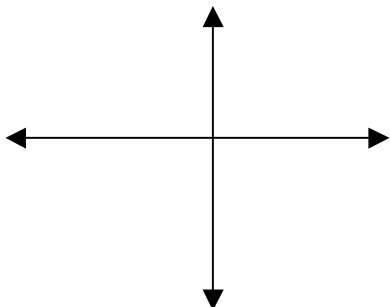Evaluate the following expressions with your calculator. Round to three decimal places.

13. $e^{\pi} =$ _____

14. $\log_5 117 =$ _____

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

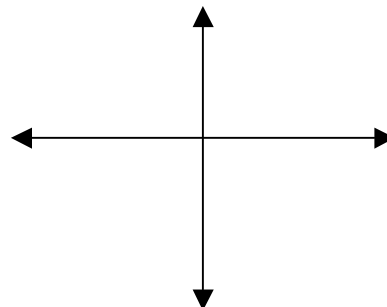15. $y = -\log_7(x-2) - 3$ 16. $y = -5^{x+3}$

Description: _____   Description: _____

_____   _____

_____   _____

_____   _____

_____   _____

17.   A total of $16,500 is invested at an annual interest rate of 7%. Find the balance after 8 years if it is compounded monthly.
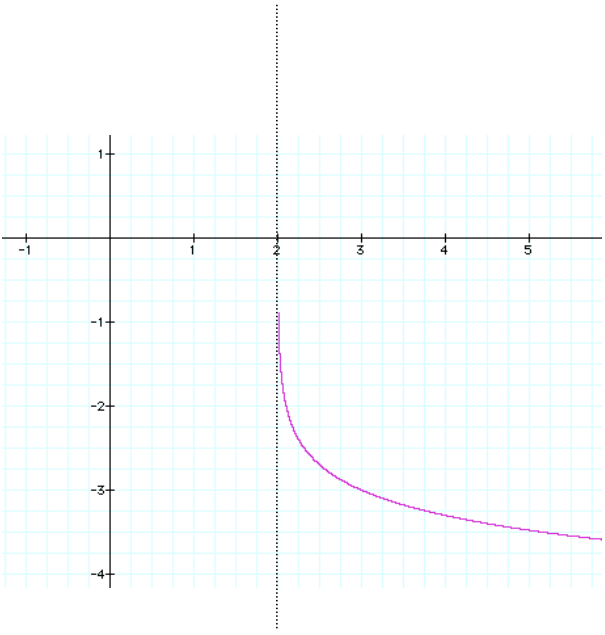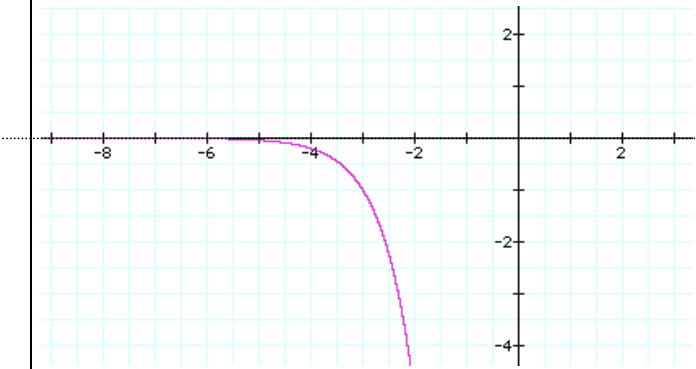
18.   A total of $12,500 is invested at an annual interest rate of 11%. Find the balance after 5 years if it is compounded continuously.

19) 3^e 20) $\log_7 7^{(x+1)}$

21.   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.

22.   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 if decay.)

23.   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?

Sample Test 4 Answers

1) $\quad y = 2^x - 6$	2) $\quad y = \log(x) + 3$
3) $\quad \ln 2 + \ln 7$	4) $\quad \ln 2 - 2\ln 7$
5) $\quad \dfrac{1}{2}\log_2(a-1) - 2\log_2 3$	6) $\quad \ln x + \ln y + 2\ln z$
7) $\quad x = -4$	8) $\quad x = 64$
9) $\quad x = \dfrac{-1}{4}$	10) $\quad x = \dfrac{\ln 42}{\ln 8}$
11) $\quad x = -3$	12) $\quad x = \dfrac{e^4}{3}$
13) $\quad$ 23.141	14) $\quad$ 2.959
15) Reflect over x axis shift right 2 and down 3.	16) reflect over x axis shift left 3.
17) $\quad$ \$ 28839.14	18) $\quad$ \$ 21665.66
19) $\quad$ 19.81299075…	20) $\quad$ x +1
21. a) 5.78 years $\qquad$ b) $\qquad$ \$3320.12	22. $\quad$ rate of decay k = (ln 0.5)/5730 after 1000 years about 2.26 grams are left.
23. $\quad$ t ≈ 13.7 years which is the later half of the year 2003.	