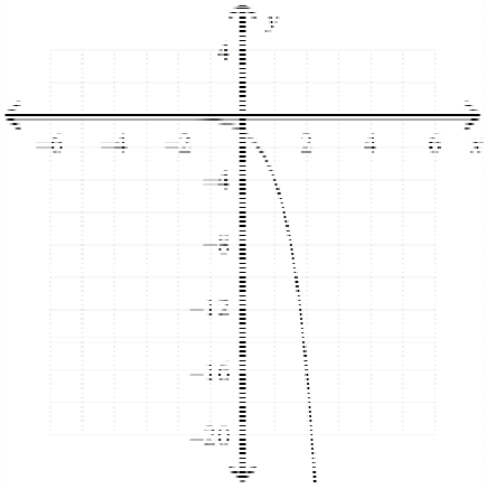
Name: _____ **ID: A**

Algebra 2 - Classwork April 25, 2014 - Review

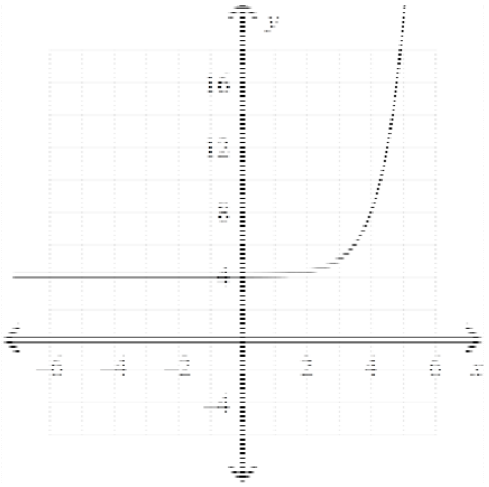
Graph the exponential function.

____ 1. $y = 4^x$

a.



c.



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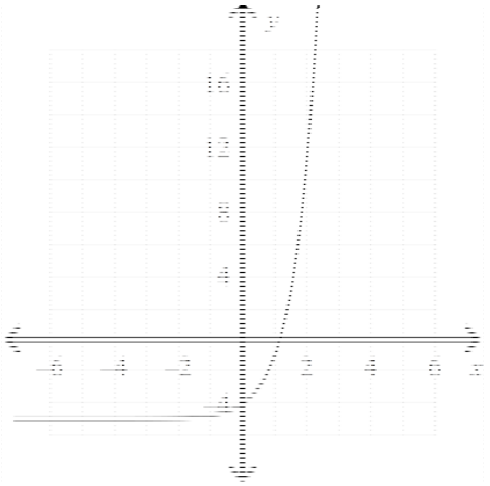

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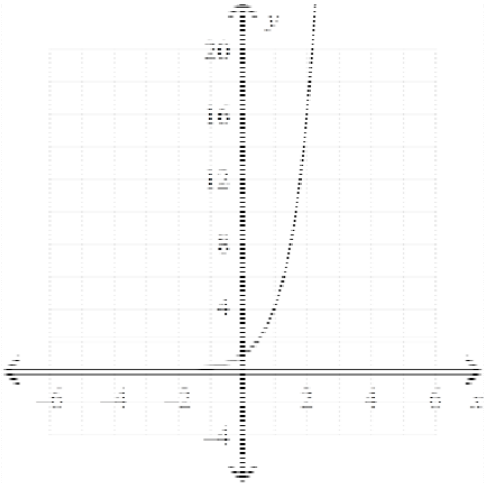


____ 2. Find the annual percent increase or decrease that $y = 0.35(2.3)^x$ models.

a. 230% increase
b. 135% increase
c. 35% decrease
d. 65% decrease

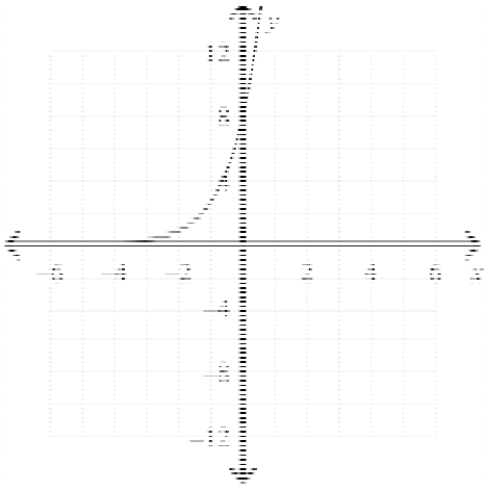
____ 3. An initial population of 820 quail increases at an annual rate of 23%. Write an exponential function to model the quail population. What will the approximate population be after 3 years?

a. $f(x) = 820(1.23)^x$; 1526
b. $f(x) = 820(23)^x$; 9,976,940
c. $f(x) = (820 \cdot 0.23)^x$; 6,708,494
d. $f(x) = 820(0.23)^x$; 1526

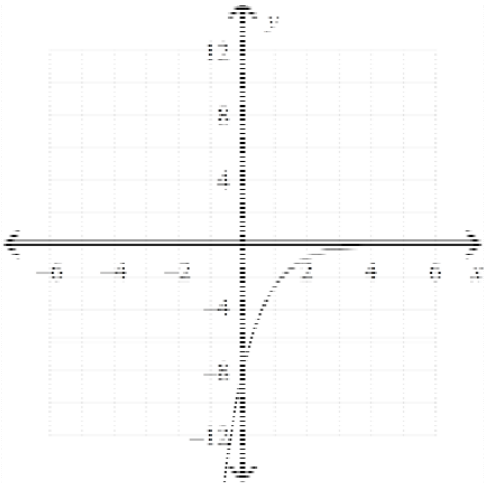
Graph the function.

____ 4. $y = 8\left(\frac{1}{3}\right)^x$

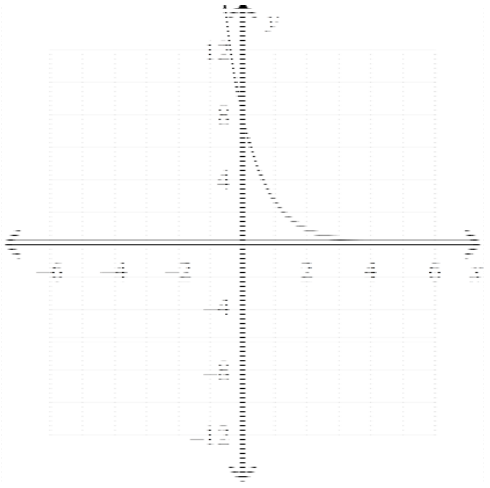
a.



c.



b.



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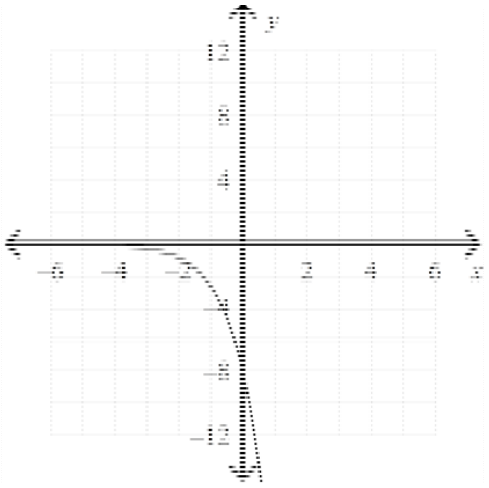
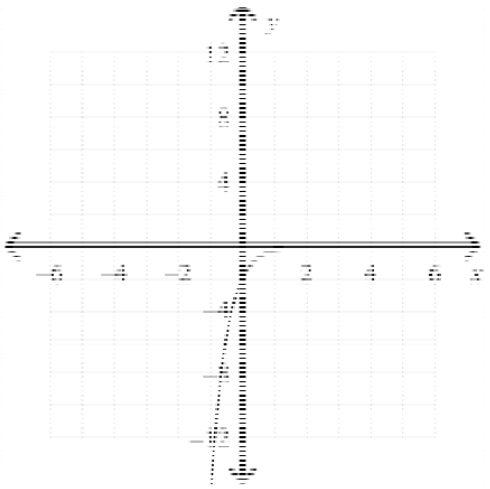


____ 5. $y = -2\left(\frac{1}{8}\right)^x$

a.



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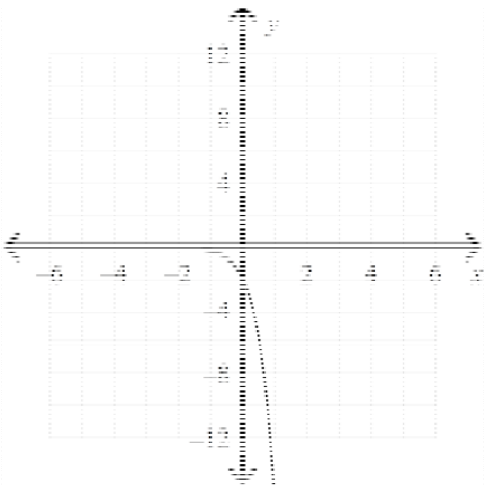

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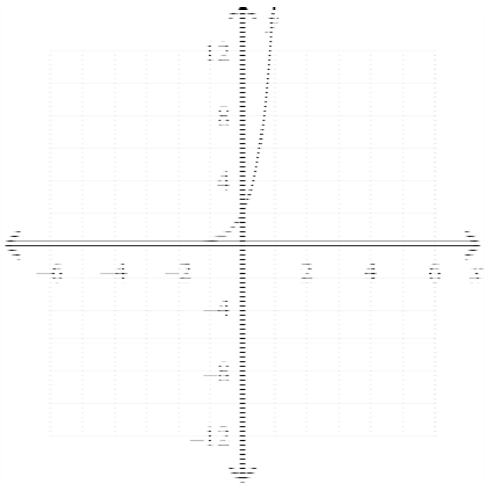
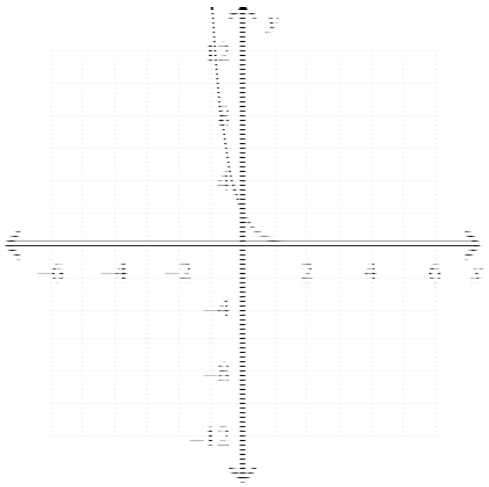
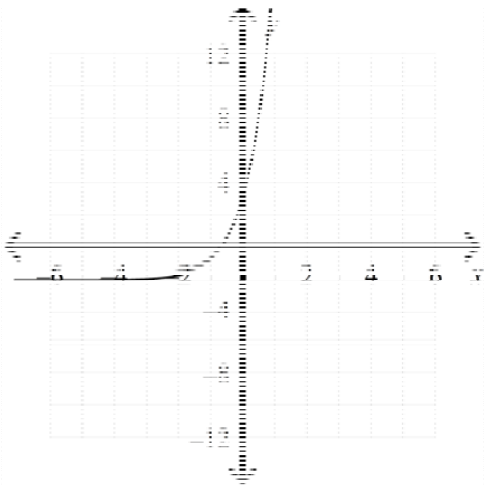


d.

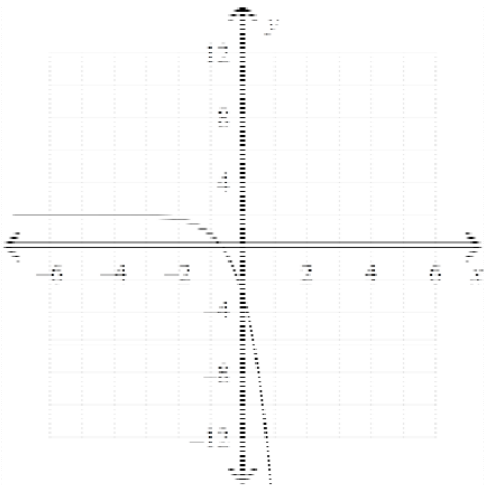


____ 6. $y = 5\left(\frac{1}{4}\right)^x + 2$

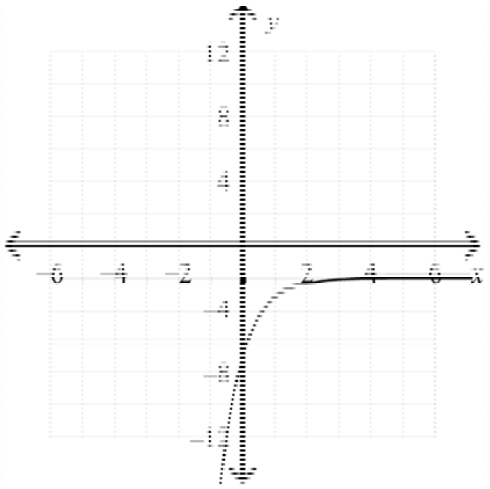
a.



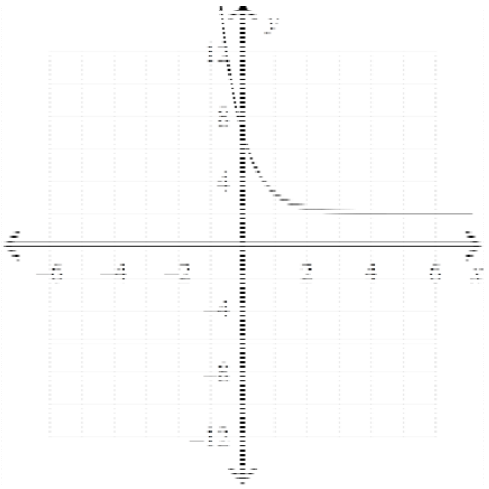
c.



b.

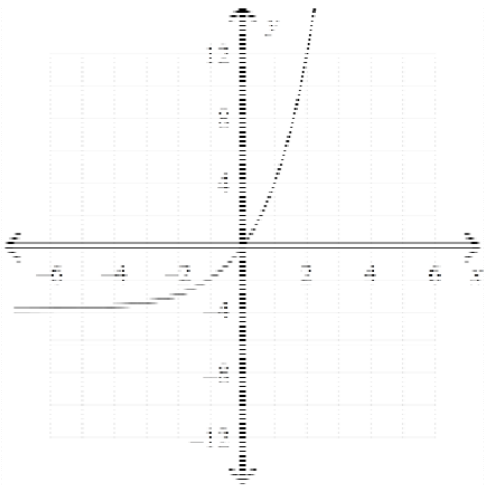


d.

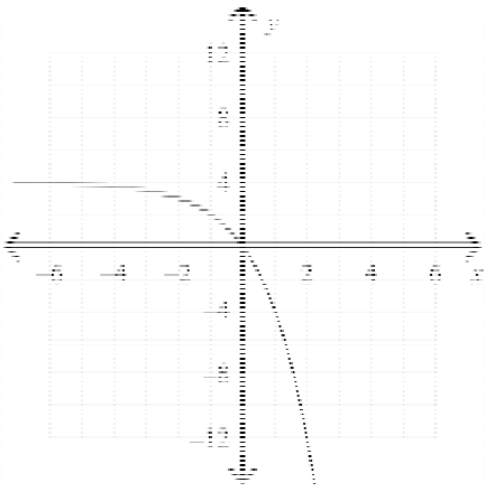


____ 7. $y = 4\left(\frac{1}{2}\right)^{x+4}$

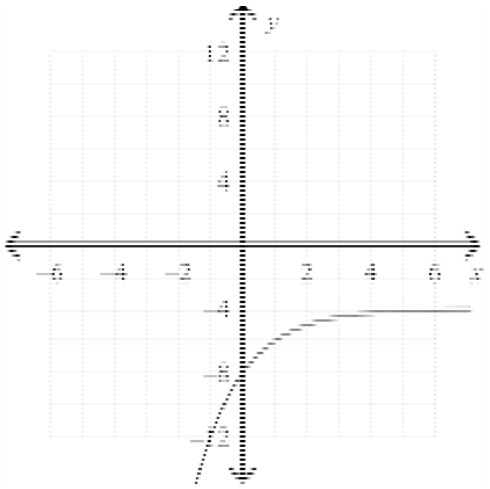
a.



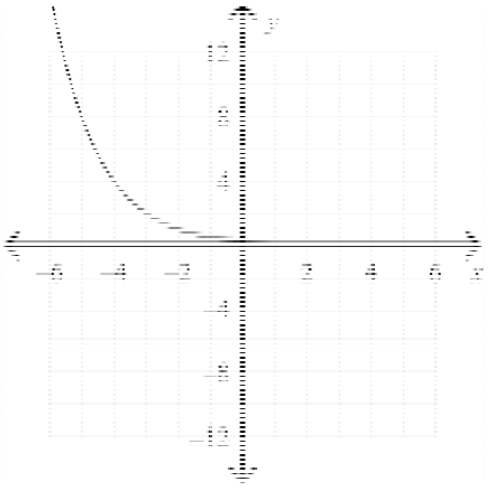
c.



b.



d.



____ 8. The half-life of a certain radioactive material is 32 days. An initial amount of the material has a mass of 361 kg. Write an exponential function that models the decay of this material. Find how much radioactive material remains after 5 days. Round your answer to the nearest thousandth.

a. $y = 361\left(\frac{1}{2}\right)^{32x}$; 0 kg

c. $y = 2\left(\frac{1}{361}\right)^{\frac{1}{32}x}$; 0.797 kg

b. $y = 361\left(\frac{1}{2}\right)^{\frac{1}{32}x}$; 323.945 kg

d. $y = \frac{1}{2}\left(\frac{1}{361}\right)^{\frac{1}{32}x}$; 0.199 kg

____ 9. Use the graph of $y = e^x$ to evaluate $e^{1.7}$ to four decimal places.

a. 5.4739 b. 4.6211 c. 2.7183 d. 0.1827

____ 10. Suppose you invest $1600 at an annual interest rate of 4.6% compounded continuously. How much will you have in the account after 4 years?

a. $800.26 b. $6,701.28 c. $10,138.07 d. $1,923.23

____ 11. How much money invested at 5% compounded continuously for 3 years will yield $820?

a. $952.70 b. $818.84 c. $780.01 d. $705.78

____ 12. You open a savings account and deposit $1,000. After 1 year of earning continuously compounded interest, your balance is $1,018.16. After 2 years, the balance is $1,036.66. Assuming you make no deposits or withdrawals, find the equation for the best-fitting exponential function to represent the balance of the account after *x* years. How much money will be in the account after 10 years?

a. $A = 1000 \cdot e^{1.8}$, $6,049.65
b. $A = 1000 + e^{0.018t}$, $1,001.20
c. $A = 1000 \cdot e^{0.018t}$, $1,197.22
d. $A = 1000 \cdot e^{1.8 * t}$, $1,001.20

Write the equation in logarithmic form.

____ 13. $2^5 = 32$

a. $\log 32 = 5 \cdot 2$
b. $\log_2 32 = 5$
c. $\log 32 = 5$
d. $\log_5 32 = 2$

____ 14. $125^{\frac{4}{3}} = 625$

a. $\log_{\frac{4}{3}} 625 = 125$
b. $3 \log_4 625 = 125$
c. $\log_{125} 625 = \frac{4}{3}$
d. $\log_{625} 125 = \frac{3}{4}$

Write the equation in exponential form.

____ 15. $\log_4 \frac{1}{16} = -2$

a. $4^{\frac{1}{2}} = 16$
b. $4^2 = 16$
c. $16^{\frac{1}{2}} = 4$
d. $4^{-2} = \frac{1}{16}$

____ 16. $\log_{(a+b)} c = 16$

a. $(a + b)^{16} = c$
b. $16^{(a+b)} = c$
c. $c^{16} = (a + b)$
d. $(a + b)^c = 16$

Evaluate the logarithm.

____ 17. $\log_5 \frac{1}{625}$

a. –3 b. 5 c. –4 d. 4

____ 18. $\log_3 243$

a. 5 b. –5 c. 4 d. 3

____ 19. $\log 0.01$

a. –10 b. –2 c. 2 d. 10

____ 20. The table shows the location and magnitude of some notable earthquakes. How many times more energy was released by the earthquake in Mexico than by the earthquake in Afghanistan? Use the given equation for comparing earthquake intensity level and magnitude.

$$\log \frac{I_1}{I_2} = M_1 - M_2$$

Earthquake Location	Date	Richter Scale Measure
Italy	October 31, 2002	5.9
El Salvador	February 13, 2001	6.6
Afghanistan	May 30, 1998	6.9
Mexico	January 22, 2003	7.6
Peru	June 23, 2001	8.1

a. about 0.70 times as much energy
b. about 12.63 times as much energy
c. about 7 times as much energy
d. about 5.01 times as much energy

____ 21. The pH of a liquid is a measure of how acidic or basic it is. The concentration of hydrogen ions in a liquid is labeled $\left[\mathrm{H}^+\right]$. Use the formula $\mathrm{pH} = -\log\left[\mathrm{H}^+\right]$ to find the pH level, to the nearest tenth, of a liquid with $[\mathrm{H}^+]$ about 6.5×10^{-3}.

a. –3.8 b. 3.8 c. 2.2 d. 3.0

Solve the exponential equation.

____ 22. $\frac{1}{16} = 64^{4x-3}$

a. $\frac{1}{12}$ b. $\frac{1}{4}$ c. $\frac{7}{12}$ d. $\frac{11}{12}$

____ 23. $4^{4x} = 8$

a. $\frac{3}{4}$ b. $\frac{8}{3}$ c. $\frac{3}{8}$ d. 2

____ 24. $125^{9x-2} = 150$

a. –1.8847 b. –0.1069 c. 0.3375 d. 1.0378

____ 25. Solve $15^{2x} = 36$. Round to the nearest ten-thousandth.

a. 0.6616 b. 2.6466 c. 1.7509 d. 1.9091

Solve the logarithmic equation. Round to the nearest ten-thousandth if necessary.

____ 26. $3 \log 2x = 4$

a. 10.7722 b. 5 c. 2.7826 d. 0.6309

____ 27. Solve $\log(4x + 10) = 3$.

a. $-\frac{7}{4}$ b. $\frac{495}{2}$ c. 250 d. 990

____ 28. Simplify $\ln e^3$.

a. 3 b. $\frac{1}{3e}$ c. $3e$ d. $\frac{1}{3}$

Use natural logarithms to solve the equation. Round to the nearest thousandth.

____ 29. $6e^{4x} - 2 = 3$

a. –0.448 b. 0.327 c. 0.067 d. –0.046

____ 30. $e^x = \frac{3}{4}$

a. –0.288 b. –0.275 c. 0.275 d. 0.288

____ 31. The sales of lawn mowers t years after a particular model is introduced is given by the function $y = 5500 \ln(9t + 4)$, where y is the number of mowers sold. How many mowers will be sold 4 years after a model is introduced? Round the answer to the nearest whole number.

a. 20,289 mowers
b. 41,709 mowers
c. 8,811 mowers
d. 19,713 mowers

32. Without graphing, determine whether the function $y = (5.2)^x$ represents exponential growth or exponential decay.

33. Without graphing, determine whether the function $y = 7\left(\frac{2}{3}\right)^x$ represents exponential growth or exponential decay.

34. In a particular region of a national park, there are currently 330 deer, and the population is increasing at an annual rate of 11%.
a. Write an exponential function to model the deer population.
b. Explain what each value in the model represents.
c. Predict the number of deer that will be in the region after five years. Show your work.