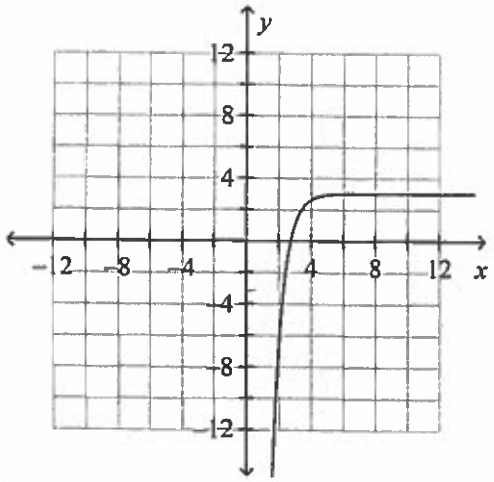
Name: KEY

ID: A

## Algebra II Review 8.1-8.3

B. 1. Graph $y = 10(5)^{x-2} - 3$. right 2 down 3

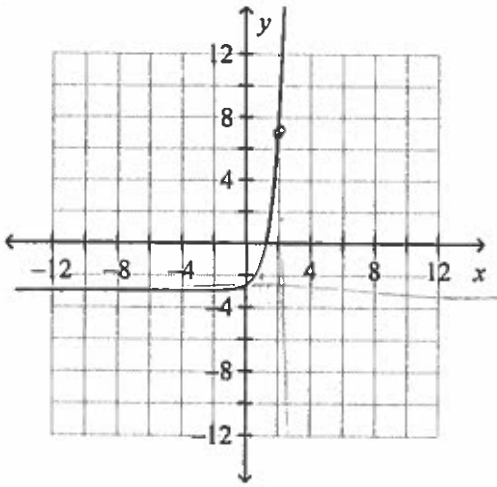
a.



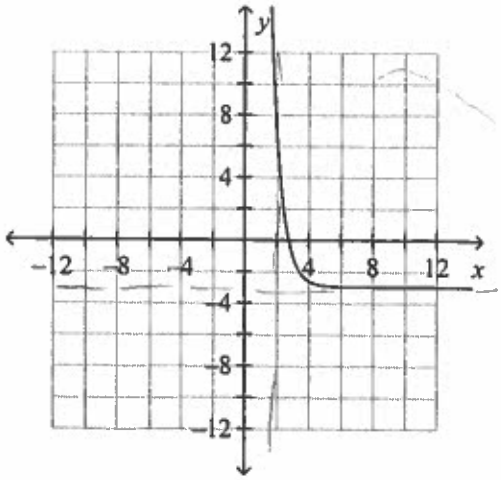

Parent: $y = 10(5)^x$

| x | y |
|---|---|
| -2 | 0.4 |
| -1 | 2 |
| 0 | 10 |
| 1 | 50 |
| 2 | 250 |

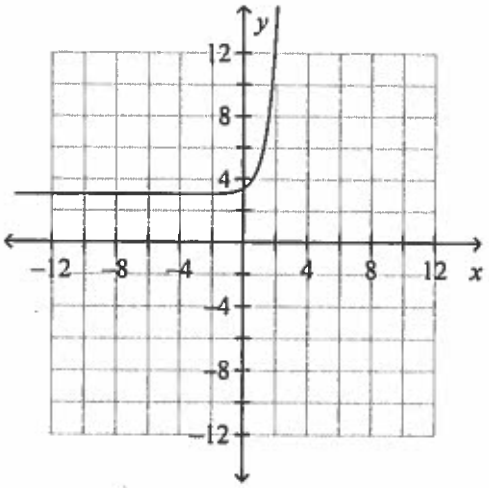
b.




c.

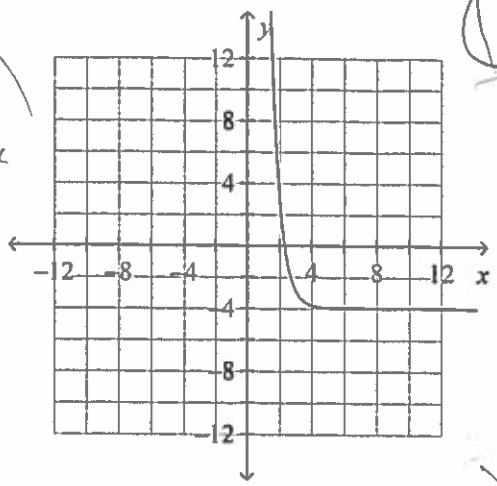



d.



C 2. Graph $y = 7\left(\frac{1}{6}\right)^{x-2} + 4$. right 2 up 4

a.

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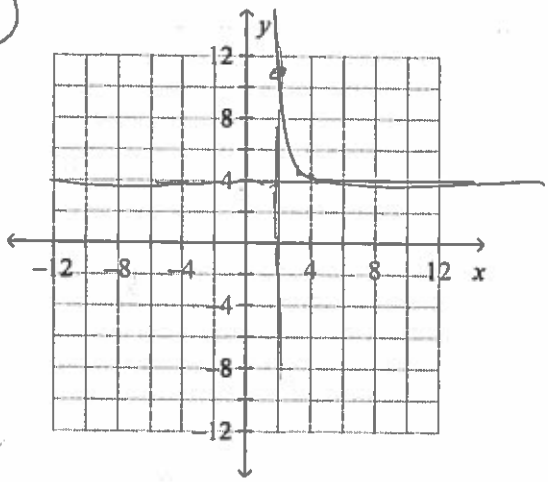
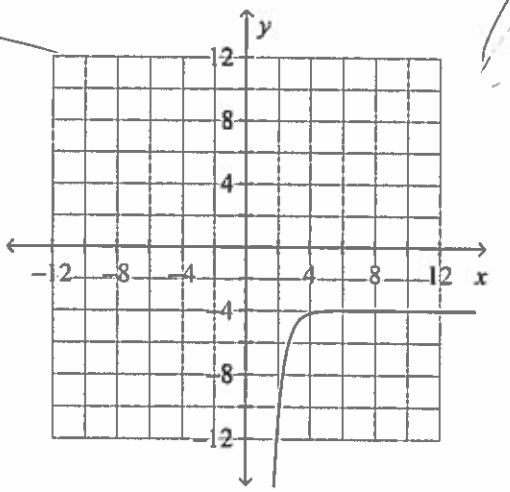


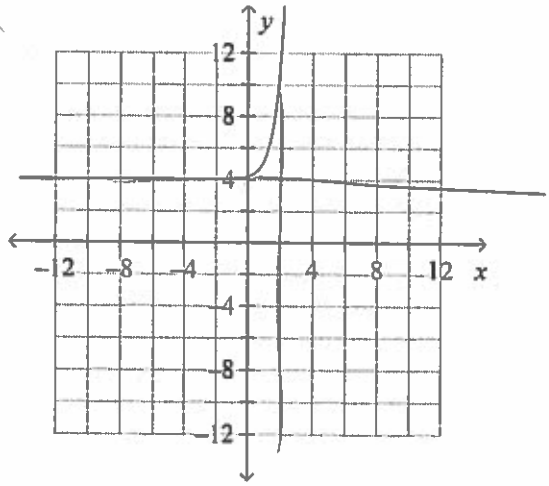

Parent: $y = 7\left(\frac{1}{6}\right)^{x}$

| x | y |
|---|---|
| −2 | 252 |
| −1 | 42 |
| 0 | 7 |
| 1 | 1.2 |
| 2 | 0.2 |

b.




d.



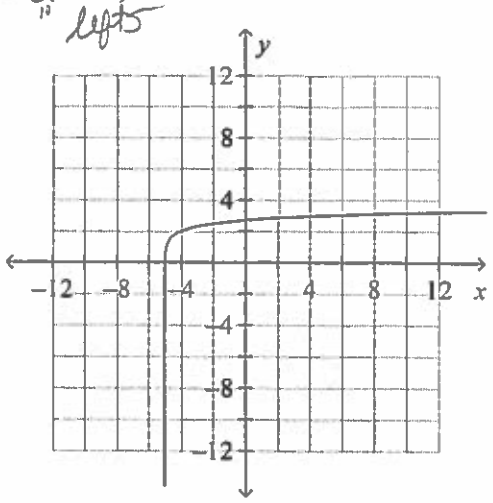
$10^y = x$

C

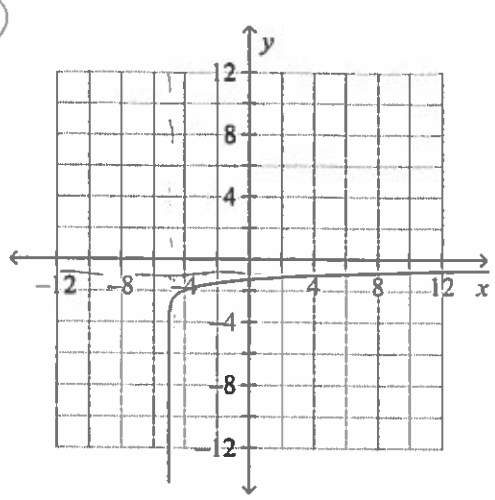
3. $y = \log(x + 5) - 2$ down 2 " left 5

a.

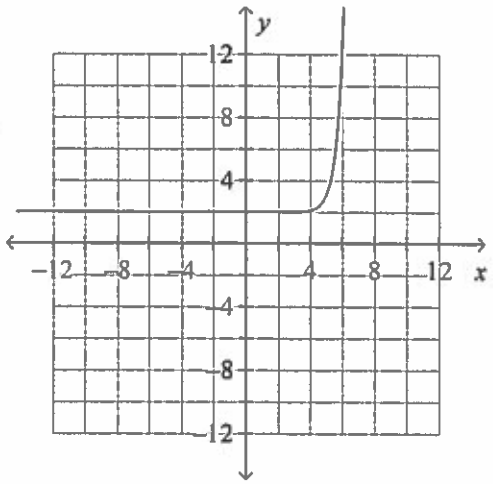
| x | y |
|---|---|
| 0.01 | −2 |
| 0.1 | −1 |
| 1 | 0 |
| 10 | 1 |
| 100 | 2 |



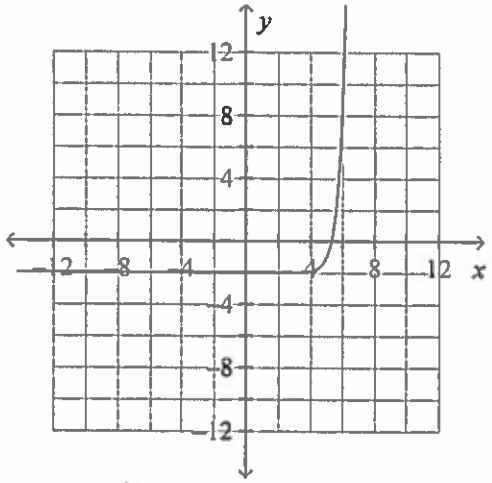

c.




b.




d.




4. Without graphing, determine whether the function $y = 5(5.4)^x$ represents exponential growth or exponential decay. growth

5. Without graphing, determine whether the function $y = 9\left(\frac{3}{16}\right)^x$ represents exponential growth or exponential decay. decay

6. Evaluate $e^{2.3}$ to four decimal places. 9.974

7. Suppose you invest $300 at an annual interest rate of 6.8% compounded continuously. How much will you have in the account after 3 years?

$y = 300e^{(0.068 \cdot 3)} = \$367.89$

8. The half-life of a certain radioactive material is 45 hours. An initial amount of the material has a mass of 926 kg.

a). Write an exponential function that models the decay of this material. $y = 926(0.5)^{t/45}$

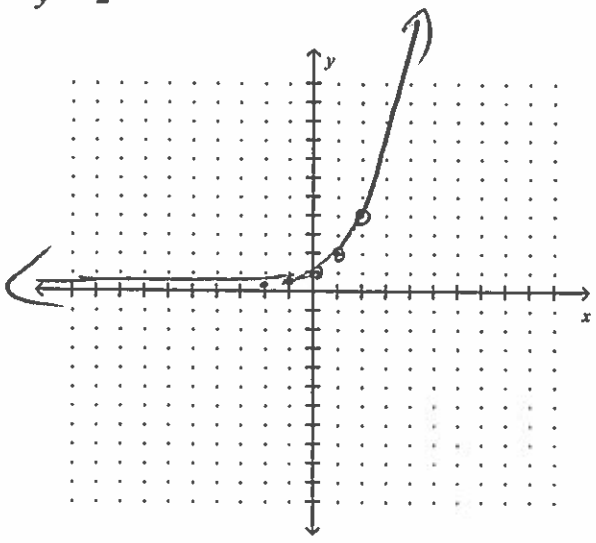
b). Find how much radioactive material remains after 8 hours. Round your answer to the nearest thousandth.

$y = 926(0.5)^{(8/45)} = 818.643$ kg

9. An initial population of 325 prairie dogs ***decreases*** at an annual rate of 12%. Write an exponential function to model the prairie dog population. Use it to find out how many are left after 5 years.

$A = 325$
$r = 0.12$
$t = 5$
$y = 325(1-0.12)^5$
$325(0.88)^5 = 171.5 \approx 171$

10. **Graph the exponential function. Use $x = \{-2, -1, 0, 1, 2\}$ for your table.**
$y = 2^x$

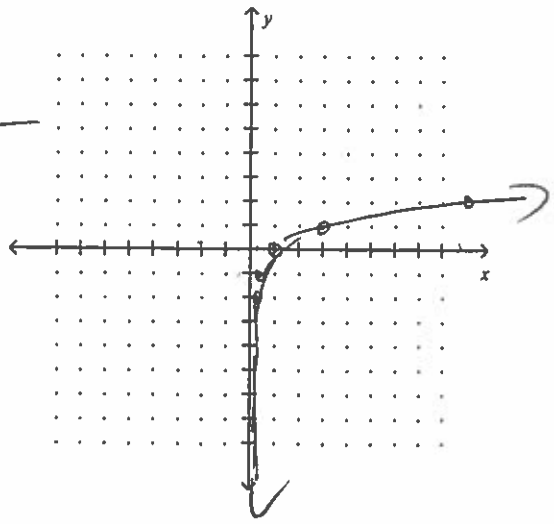


| x | $2^x$ | y |
|---|---|---|
| -2 | $2^{-2}$ | 1/4 |
| -1 | $2^{-1}$ | 1/2 |
| 0 | $2^0$ | 1 |
| 1 | $2^1$ | 2 |
| 2 | $2^2$ | 4 |

11. **Graph the logarithmic equation.**
$y = \log_3 x$. Use $y = \{-2, -1, 0, 1, 2\}$ for your table.

$3^y = x$

| x | y |
|---|---|
| 1/9 | -2 |
| 1/3 | -1 |
| 1 | 0 |
| 3 | 1 |
| 9 | 2 |



**In 9 - 10, write the equation in logarithmic form.**

12. $4^7 = 16,384$ $\log_4 16384 = 7$

13. $3^4 = 81$ $\log_3 81 = 4$

14. Write the equation $\log_{27} 9 = \frac{2}{3}$ in exponential form.

$27^{2/3} = 9$

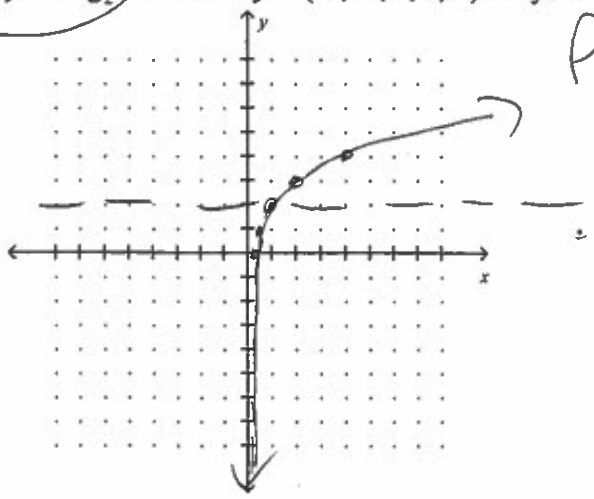
**In 12 - 14, set the equation equal to *x* and evaluate the logarithm.**

15. $\log_5 125 = x$ $5^x = 125$ $x = 3$

16. $\log_7 \frac{1}{49} = x$ $7^x = \frac{1}{49}$ $x = -2$

17. $\log_{10} 0.001 = x$ $10^x = 0.001$ $x = -3$

18. **Graph the logarithmic equation.** up 2
$y = \log_2 x + 2$. Use $y = \{-2, -1, 0, 1, 2\}$ for your table.

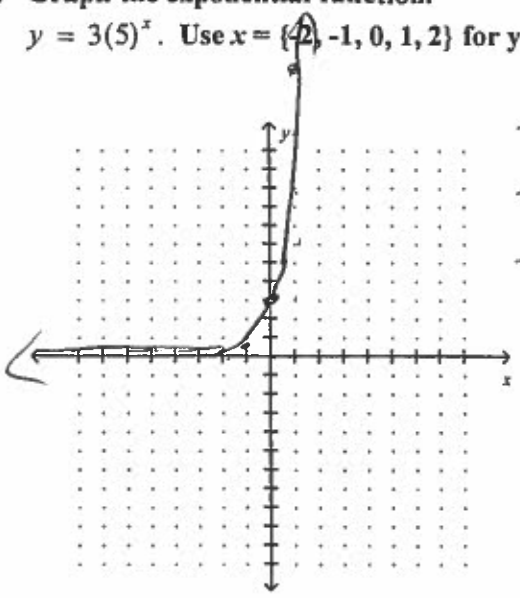



Parent: $2^y = x$

| x | y |
|---|---|
| 1/4 | -2 |
| 1/2 | -1 |
| 1 | 0 |
| 2 | 1 |
| 4 | 2 |

19. **Graph the exponential function.**

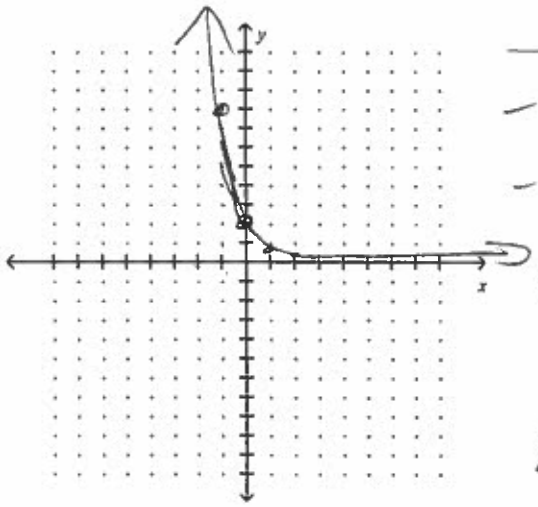
$y = 3(5)^x$. **Use $x = \{-2, -1, 0, 1, 2\}$ for your table.**



| $x$ | $3(5)^x$ | $y$ |
|---|---|---|
| $-2$ | $3(5)^{-2}$ | $3/25 = 0.12$ |
| $-1$ | $3(5)^{-1}$ | $3/5 = 0.6$ |
| $0$ | $3(5)^0$ | $3$ |
| $1$ | $3(5)^1$ | $15$ |
| $2$ | $3(5)^2$ | $72$ |

20. **Graph the function. ~~Identify the horizontal asymptote.~~**

$y = 2\left(\frac{1}{4}\right)^x$. **Use $x = \{-2, -1, 0, 1, 2\}$ for your table.**



| $x$ | $2\left(\frac{1}{4}\right)^x$ | $y$ |
|---|---|---|
| $-2$ | $2\left(\frac{1}{4}\right)^{-2}$ | $32$ |
| $-1$ | $2\left(\frac{1}{4}\right)^{-1}$ | $8$ |
| $0$ | $2\left(\frac{1}{4}\right)^0$ | $2$ |
| $1$ | $2\left(\frac{1}{4}\right)^1$ | $1/2$ |
| $2$ | $2\left(\frac{1}{4}\right)^2$ | $1/8$ |