

## Exponential Functions: Applications &amp; Graphs

Date \_\_\_\_\_ Period \_\_\_\_\_

1)

In order to control plant eating insects, Mr. Wilson released 17 ladybugs in the DA Sculpture Garden. The ladybug population is expected to double each month.

a) Write an equation that will predict the number of ladybugs over time.

b) How many ladybugs would we expect there to be after 5 months?

c) How many ladybugs would there be after one year?

2) When you take a certain medication, it decays in such a way that after each hour, half of the remaining medication is used up. You are instructed to take 1200 mg. of the medication at a time.

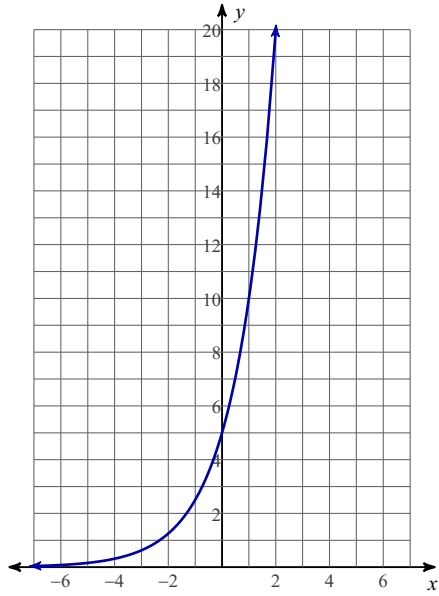
a) Write an equation  $m(t)$  that will calculate the remaining medicine in your system each hour ( $t$ ).

b) Find  $m(3)$ . What does this represent?

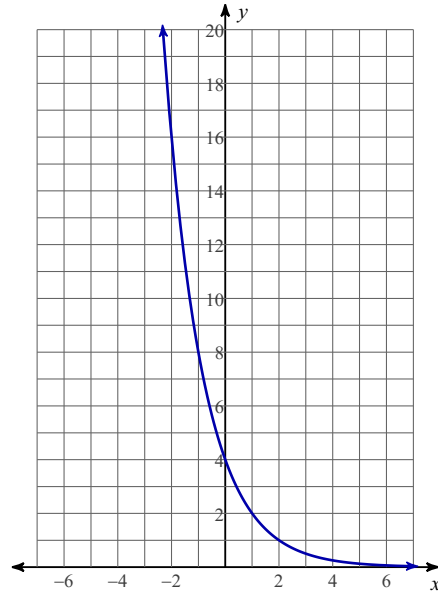
c) How much medicine would remain in the body after 12 hours?

Write an exponential equation in the form  $f(x) = a \cdot b^x$  for each graph.

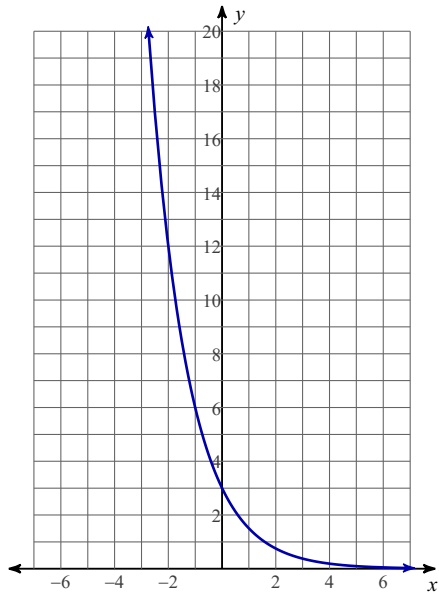
3)



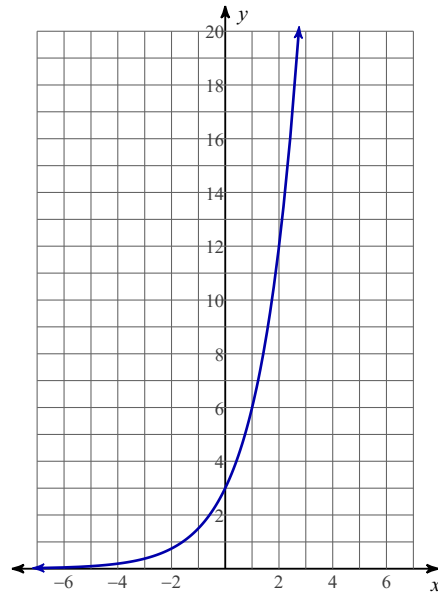
4)



5)

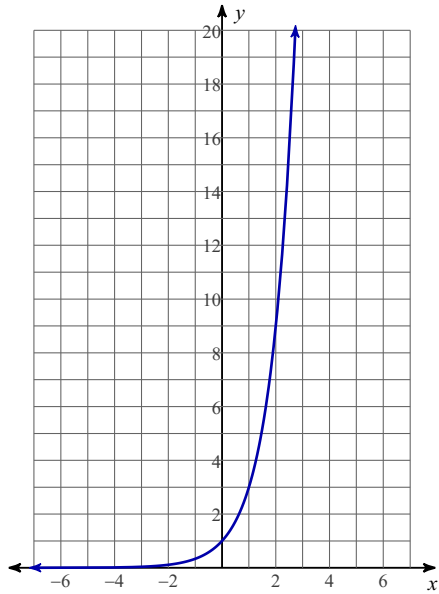


6)

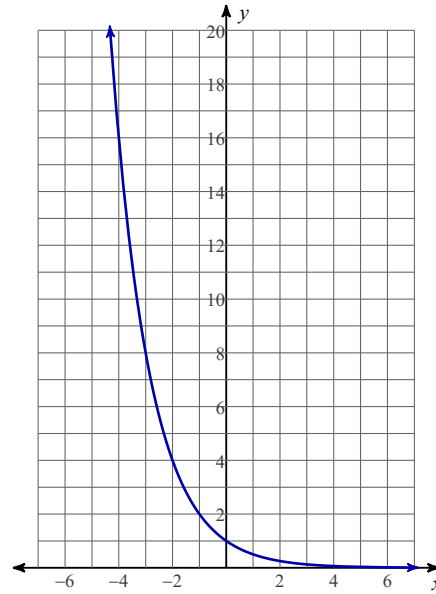


Write an equation for each graph.

7)

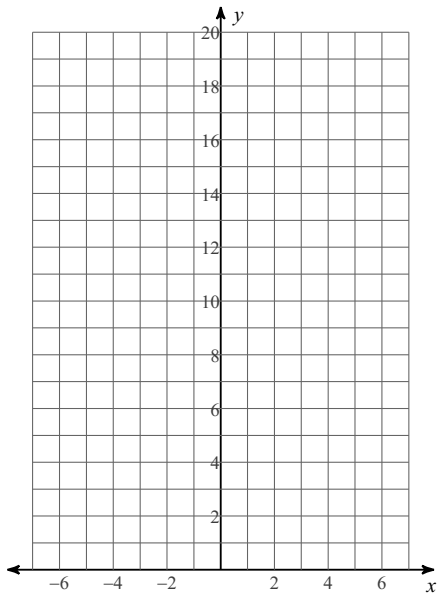


8)

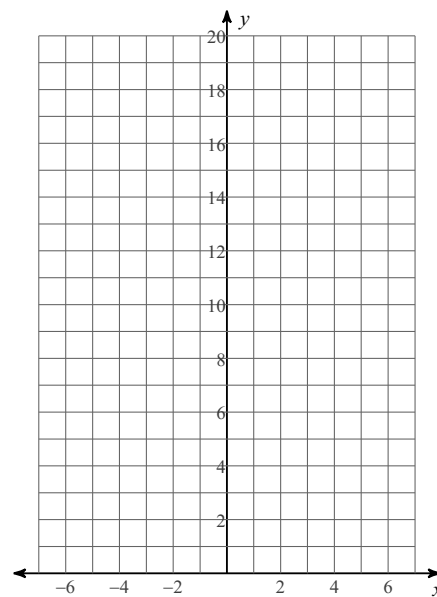


Sketch the graph of each function.

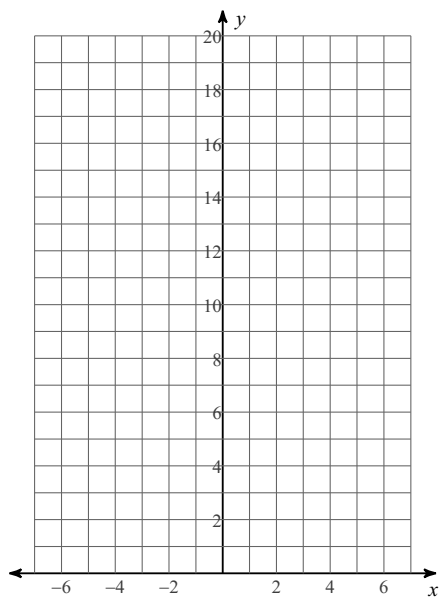
9)  $f(x) = 2^x$



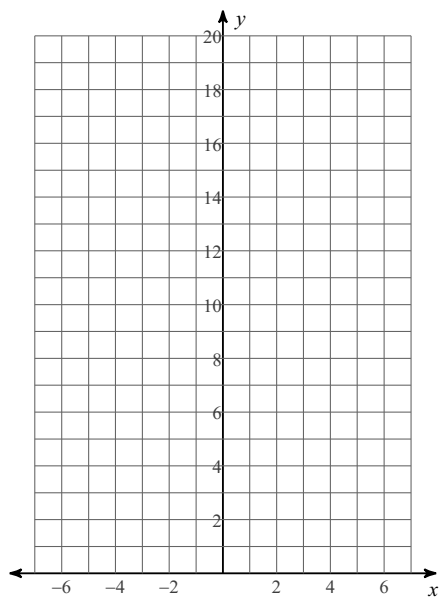
10)  $f(x) = \left(\frac{1}{3}\right)^x$



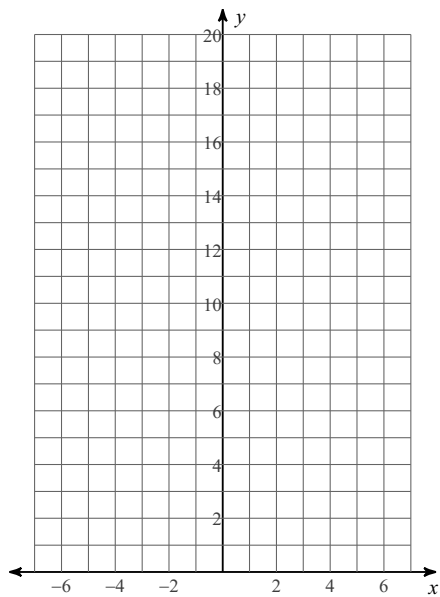
11)  $f(x) = 5 \cdot 2^x$



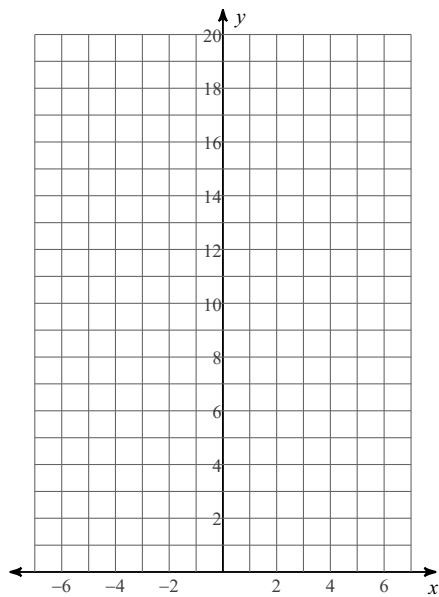
12)  $f(x) = 2 \cdot 2^x$



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



14)  $f(x) = 5 \cdot \left(\frac{1}{2}\right)^x$



## Answers to Exponential Functions: Applications & Graphs

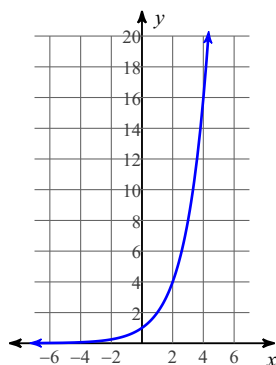
1) a)  $L = 17 \cdot 2^m$

b)  $L = 17 \cdot 2^5 = 544$  Ladybugs

c)  $L = 17 \cdot 2^{12} = 69,632$  Ladybugs

7)  $y = 3^x$

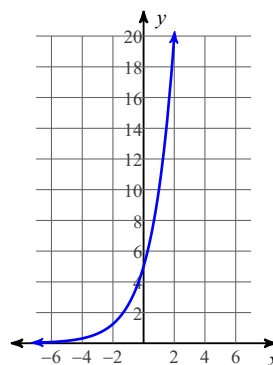
9)



3)  $f(x) = 5 \cdot 2^x$

5)  $f(x) = 3 \cdot \left(\frac{1}{2}\right)^x$

11)



13)

