

Determine if the following functions are exponential functions. Explain your answer.

1) $y = 2^x$

2) $y = x^2$

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

4) $y = (1.05)^x$

5) $y = 3 \cdot 9^{-x}$

6) $y = 0.95^x$

7) $y = 0.5 \cdot x^{1/2}$

8) $y = 3x^5 + 3x$

9) $y = \pi^{x+1}$

Tell whether the exponential function shows growth or decay. Explain your answer.

10) $y = 4^x$

11) $y = \left(\frac{1}{4}\right)^x$

12) $y = (0.5)^x$

13) $y = (1.2)^x$

14) $y = 2 \cdot \left(\frac{3}{4}\right)^x$

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

16) $y = 4^{-x}$

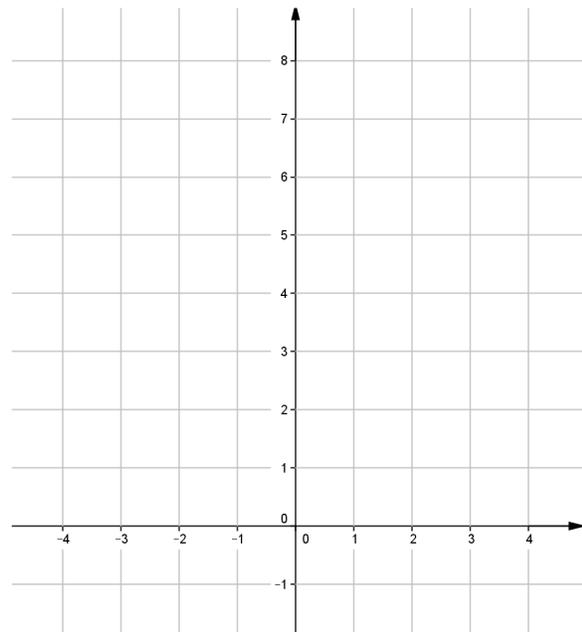
17) $y = \left(\frac{1}{3}\right)^{-x}$

18) $y = 3 \cdot 2^{x-2} + 2$

Use a table of values to graph the exponential functions.

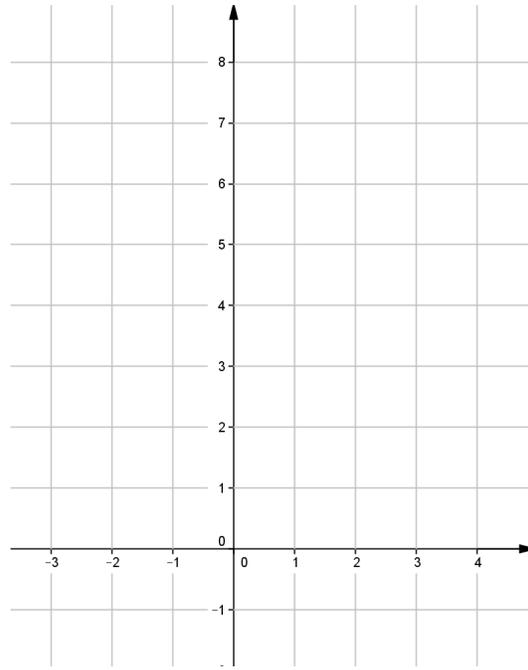
19)

$f(x) = 2^x$	
x	$f(x)$
-3	
-2	
-1	
0	
1	
2	
3	



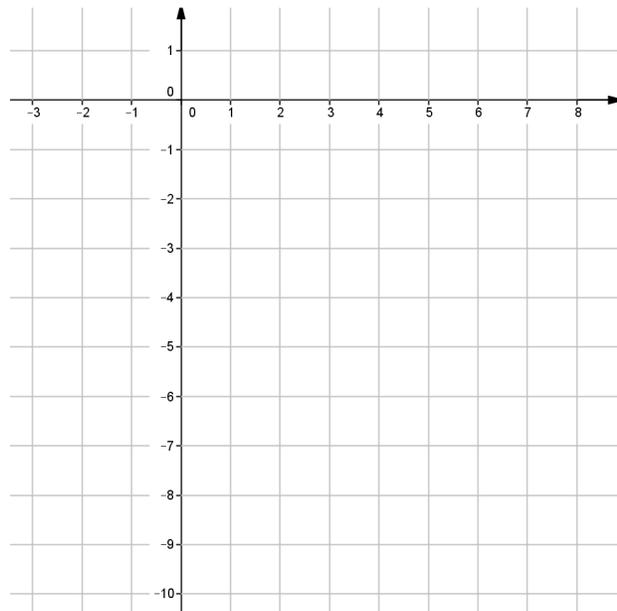
20)

$f(x) = \left(\frac{1}{3}\right)^x$	
x	$f(x)$
-2	
-1	
0	
1	
2	
3	



21)

$f(x) = -2 \cdot (2)^{-x}$	
x	$f(x)$
-2	
-1	
0	
1	
2	
3	



Model the following problems as an exponential function of the form: $A(t) = a(1 \pm r)^t$

22) A certain car depreciates about 15% each year.

- a) Write a function to model the depreciation value for a car that was originally worth \$20,000.

- b) Suppose the car was originally worth \$20,000 in 2005. What is the first year in which the value of the car will be worth less than half of the original value?

23) Rose invests \$5000 in an account that pays 6.25% interest per year.

- a) Write a function that models the growth in value of her investment.

- b) After how many years will her investment be worth \$10,000?

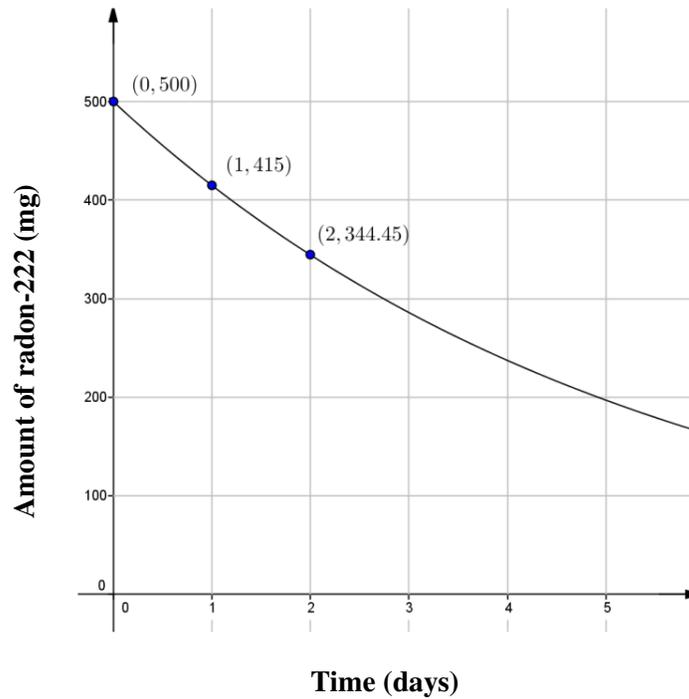
24) A city population, which was initially 15,000 has been dropping by 3% a year.

- a) Write an exponential function that models the drop in population.

- b) When will the population drop below 8000?

25) Radon-222 is a gas that escapes from rocks and soil. It can accumulate in buildings and can be dangerous for people who breathe it. Radon-222 decays to polonium and eventually to lead.

Radon-222 Decay



- a) Using the graph above, find the percent decrease in the amount of radon-222 each day.
- b) Write an exponential decay function for the amount of 500 mg sample of radon-222 remaining after t days.
- c) How much of the radon-222 sample would remain after 14 days?