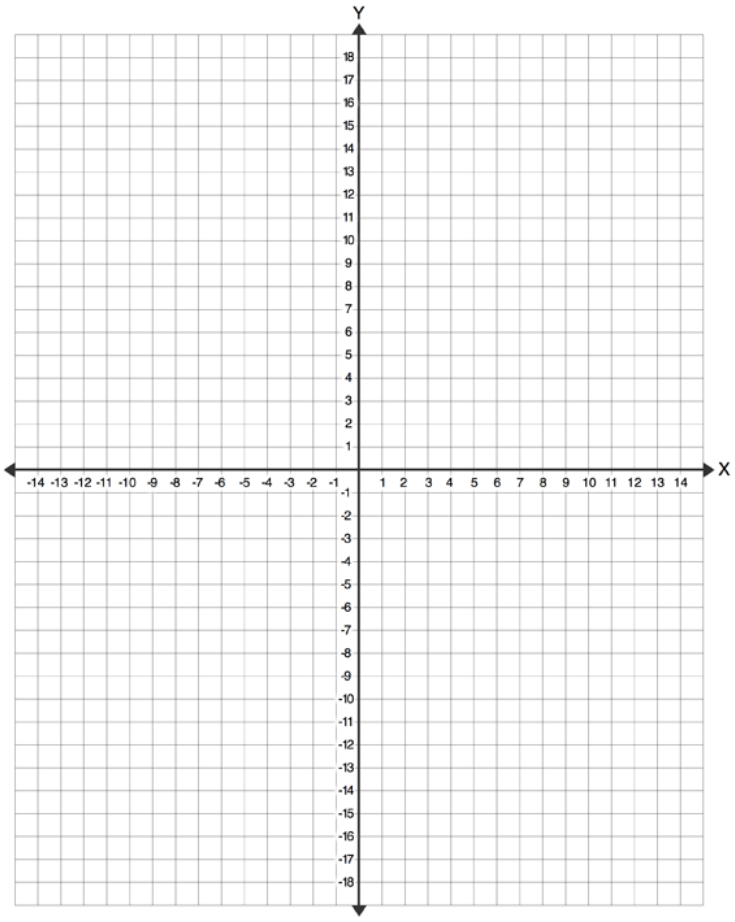
Unit 8.2 Exponential Functions and Half Life

1. Graph the following equation and draw its asymptote

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

x	f(x)
-2	
-1	
0	
1	
2	
3	
4	



2. Define each as growth or decay

   a. $f(t) = 6000\ (1 - 0.4)^t$ _____

   b. $f(t) = 23{,}000\ (1 + 0.2)^t$ _____

   c. $f(x) = 4 + 5^{(-x)}$ _____

   d. $f(x) = 2^{(x+3)}$ _____

2. Bacteria will grow in a lab according to the function $f(t) = y_0 * 5^{0.2t}$ where y_0 is the initial amount of bacteria and t is the amount of time in hours. How much bacteria will be present at the end of 5 hours if there were 5000 bacteria initially?

   _____

3. You earned $1500 and put it in a bank. Through the bank, that money earns 5% interest compounded annually. How much money will there be after 5 years if you don't add any more to the account?

   _____

4. You buy a new truck with all that money you are making as a successful technician for $67,000. The value depreciates on that truck by a rate of 20% each year till the 5 year mark. How much is that truck worth at the end of 5 years?

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5. A fish pond's population is dying at an exponential rate. The pond started with 1046 fish in 2010, and every year the population decreases by 0.2%. How many fish were in the pond in 2018 to the nearest whole fish?

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6. The half life of Zn-71 is 2.4 minutes. If you started out with 100.0 g of the material initially, how much would be left after 7.2 minutes?

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7. Pd-100 has a half life of 3.6 days. If you had 6.02×10^{23} atoms a the start of your experiment, how many atoms would you have at 20 days?

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