

- A. Determine if each scenario represents exponential growth, decay, or neither. Give a reason for your answer.
- a) X =number of times you fold a paper in half, Y =number of sections on the paper
 - b) X =Time in years, Y =Value of a car
 - c) X =Hours worked, Y =Money earned at job
 - d) X =Number of people on a Netflix account, Y =Cost per person for Netflix account

B. A population of 92 fruit flies triples **every two days**.

- a) How many fruit flies are there on day 4?
- b) How many fruit flies are there on day 5?
- c) Write an equation that gives the number of fruit flies on day n .

C. A swimmer wants to qualify for the Olympics. His plan is to reduce his time by 3% each week of the summer. Do his swim times for each week of the summer represent an arithmetic sequence? Why or why not?

D. Let $f(x) = 3^{x-4} + 8$.

- a) List the parent function of f and all the transformations that occurred to produce the graph of f .
- b) What is the domain and range of f ?
- c) Write the equation of any asymptotes of f .
- d) Find the y-intercept of the graph of f .

E. Place a checkmark next to the functions that are equivalent to $y = 4^{x-2}$.

_____ $4 \cdot 4^x$

_____ $16 \cdot 4^x$

_____ $-4^2 \cdot 4^x$

_____ $\frac{1}{16} \cdot 4^x$

_____ 4^{x+2}

_____ -4^x

F. A Sequence has 64 as its 5th term and 125 as its 8th term.

- a) Write an explicit rule for the sequence if the sequence is arithmetic.
- b) Write an explicit rule for the sequence if the sequence is geometric.

G. \$12,000 is put into an account earning 2.3% interest. How much money will be in the account after 1 year if interest is earned...

a) Every 6 months

b) Continuously

H. Which is bigger?

The common ratio, r , in a geometric sequence with $a_2 = 24$ and $a_5 = 1536$

OR

The common difference, d , in an arithmetic sequence with $a_4 = 3$ and $a_7 = 16$

I. The number of books in a certain library doubles every year. After 6 years, there are 28,800 books in the library. How many books were in the library when it first opened?

J. Find the number of small squares in the 43rd figure.



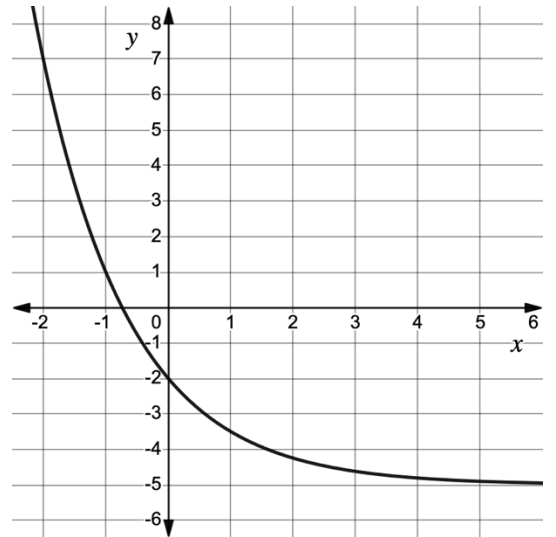
Figure 1

Figure 2

Figure 3

Figure 4

- K. The graph of $y = g(x)$ is shown. The function can be written in the form $g(x) = a \cdot b^x + d$ for some constants a, b , and d . Find the values of a, b , and d .



- L. Data for a function f is given in the table.

x	$f(x)$
4	2.1
7	3.2
8	4.8
11	7.3
12	8.4

- Determine if a linear or exponential regression model is appropriate for this data. Explain your reasoning.
- Write an exponential or linear regression equation for this set of data, rounding all values to four decimal places.
- What is the constant rate of change or constant percent growth rate of your model?
- Use your model to predict $f(16)$.

M. Would you rather earn 5% interest compounded quarterly or 4% interest compounded monthly? Show all the calculations that help you make your decision.