The founder of a popular social media website is trying to inspire gifted algebra students to study computer programming. He is offering two different incentive programs for students.

Option 1: Students will earn one penny for completing their first math, science, or computer-related college course. The amount earned will double for each additional course they complete.

Option 2: Students will earn one penny for completing their first math, science, or computer-related college course. For each subsequent course they complete, they will earn $100.00 more than they did for the previous course.

Write an explicit formula for each option.

① $a_n = 0.01(2)^{n-1}$

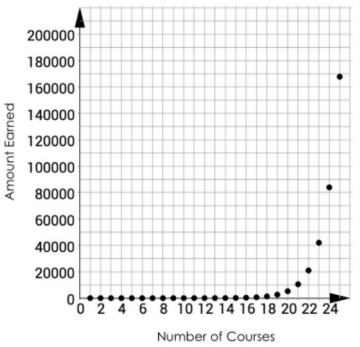
② $a_n = 0.01 + 100(n-1)$

Compare the two scholarship options in the tables below.

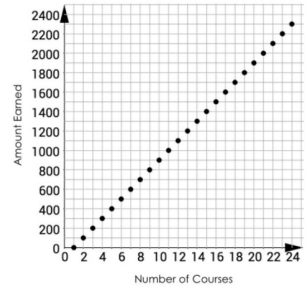
Option 1	
Course	Amount
1	$0.01
2	$0.02
3	$0.04
4	$0.08
5	$0.16
6	$0.32
7	$0.64
8	$1.28
9	$2.56
10	$5.12
11	$10.24
12	$20.48
13	$40.96
14	$81.92
15	$163.84
16	$327.68
17	$655.36
18	$1,310.72
19	$2,621.44
20	$5,242.88
21	$10,485.76
22	$20,971.52
23	$41,943.04
24	$83,886.08
25	$167,772.16

Option 2	
Course	Amount
1	$0.01
2	$100.01
3	$200.01
4	$300.01
5	$400.01
6	$500.01
7	$600.01
8	$700.01
9	$800.01
10	$900.01
11	$1,000.01
12	$1,100.01
13	$1,200.01
14	$1,300.01
15	$1,400.01
16	$1,500.01
17	$1,600.01
18	$1,700.01
19	$1,800.01
20	$1,900.01
21	$2,000.01
22	$2,100.01
23	$2,200.01
24	$2,300.01
25	$2,400.01

Option 1



Option 2



Option 1 is a geometric sequence.

- Each term is the product of the previous term and two.
- This geometric sequence follows a(n) exponential pattern.
- Evaluate the domain of this function. Natural #s 1,2,3,4...

Option 2 is an arithmetic sequence.

- Each term is the sum of the previous term and 100.
- Arithmetic sequences follow a(n) linear pattern.
- Evaluate the domain of this function. Natural #s

What can be said about the domain of arithmetic and geometric sequences? Integers!

1. Consider the two scholarship options for studying computer science.

   a. Which scholarship option is better if your college degree requires 10 math, engineering, or programming courses?

   Option 2

   b. What if your degree requires 25 math, engineering, or programming courses?

   Option 1

   c. Do you think that these graphs represent discrete or continuous functions? Justify your answer.

   Discrete; You can only take whole # courses

   d. Do you think Option 1 would ever be offered as a scholarship? Why or why not?

   Probably not!

Pablo and Lily are saving money for their senior trip next month. Pablo's goal is to save one penny on the first day of the month and to triple the amount he saves each day for one month. Lily's goal is to save $10.00 on the first day of the month and increase the amount she saves by $5.00 each day.

a. Pablo's savings plan is an example of a(n)

o arithmetic sequence.
o geometric sequence.

b. Lily's savings plan is an example of a(n)

o arithmetic sequence.
o geometric sequence.

c. Which person do you think will be able to meet his/her goal? Explain.

Lily

Circle the best answers to complete the following statement.

Arithmetic sequences follow a(n) linear | exponential | quadratic pattern, whereas geometric sequences follow a(n) linear | exponential | quadratic pattern, and the domain of both sequences is a subset of the integers | radicals | exponents.

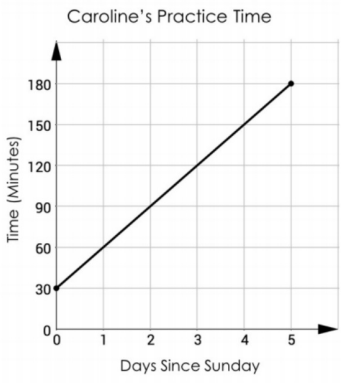
On Sunday, Chris and Caroline will begin their final preparations for a piano recital the following Saturday. Caroline plans to practice 30 minutes on the Sunday prior to the recital and increase her practice time by 30 minutes every day leading up to the recital. Chris plans to practice half of Caroline's time on Sunday, but will double his practice time every day leading up to the recital.

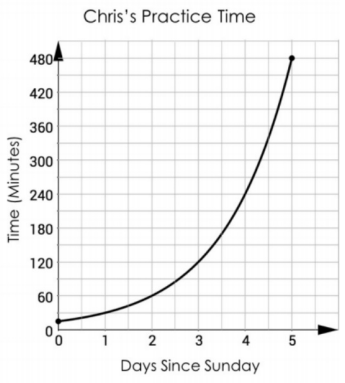
Part A: List Caroline's and Chris's practice times on the tables below.

Caroline's Practice Times	
1	30
2	60
3	90
4	120
5	150
6	180

Chris's Practice Times	
1	15
2	30
3	60
4	120
5	240
6	480

Part B: Compare the graphs of Caroline's and Chris's practice times. Identify each graph as linear or exponential.





Linear

Exponential