

$n$	1	2	3	4	5	6	7	8	9	10	11
$f(n)$	27	24	21	18	15	12	9	6	3	0	-3

Use the table above to answer #13-16

- 13) If  $f(n) = 15$ , what is the value of  $n$ ? 5 then find  $f(n+4)$  3 and  $f(n-2)$  21  
 14) If  $f(n) = 24$ , what is the value of  $n$ ? 2 then find  $f(n+6)$  6 and  $f(n+8)$  0  
 15) If  $f(n) = 3$ , what is the value of  $n$ ? 9 then find  $f(n-7)$  24 and  $f(n+1)$  0  
 16) If  $f(n) = 18$ , what is the value of  $n$ ? 4 then find  $f(n-1)$  21 and  $f(n+3)$  9

Find the missing terms of each arithmetic sequence

- 17) 

$n$	1	2	3	4	5	6	7
$f(n)$	4	11	18	25	32	39	46

 $\frac{46-4}{7-1} = \frac{42}{6} = 7$   
 18) 

$n$	3	4	5	6	7
$f(n)$	50	43	36	29	22

 $\frac{22-50}{7-3} = \frac{-28}{4} = -7$   
 19) 

$n$	0	1	2	3	4	5	6	7
$f(n)$	96	93	90	87	84	81	78	75

 $\frac{75-96}{7-0} = \frac{-21}{7} = -3$   
 20) 

$n$	4	5	6	7	8
$f(n)$	17	32	47	62	77

 $\frac{77-17}{8-4} = \frac{60}{4} = 15$

Find the missing terms of each geometric sequence

- 17) 

$n$	1	2	3	4	5
$f(n)$	2	8	32	128	512

 $5-1=4$   
 $\sqrt[4]{\frac{512}{2}} = \sqrt[4]{256} = 4$   
 18) 

$n$	2	3	4	5
$f(n)$	13	39	117	351

 $5-2=3$   
 $\sqrt[3]{\frac{351}{13}} = \sqrt[3]{27} = 3$   
 19) 

$n$	0	1	2	3	4	5	6
$f(n)$	384						6

 $6-0=6$   
 $\sqrt[6]{\frac{6}{384}}$   
 20) 

$n$	7	8	9	10	11
$f(n)$	5625	1125	225	45	9

 $11-7=4$   
 $\sqrt[4]{\frac{9}{5625}} = \sqrt[4]{\frac{1}{625}} = \frac{1}{5}$

For each situation, identify the two variables, make a table of values, a (fully labeled) graph, and write both recursive and explicit equations. Show all work on a separate sheet of paper.

- 21) Jai'Lin is saving money to buy a boat. He has \$400 and plans to save \$50 more every week until he has enough.  
 22) Liza is starting a new work out plan. She plans to do 5 sit-ups the first day, then add 2 more sit-ups every day.  
 23) Maria started a new job. She was promised a salary of \$35,000 for the first year and a 5% increase every year.  
 24) Julian is determined to eat healthier. He realizes that he currently consumes about 50 mg of sugar in a typical day. He plans to reduce that amount by 5 mg every day.  
 25) Haylie worked all summer and saved \$450. She plans to spend \$10 per week on after school snacks.  
 26) Aidan is interested in the stock market. He has been watching one particular company's value. It was originally valued at \$250 per share. It has lost \$12% of its value every week.



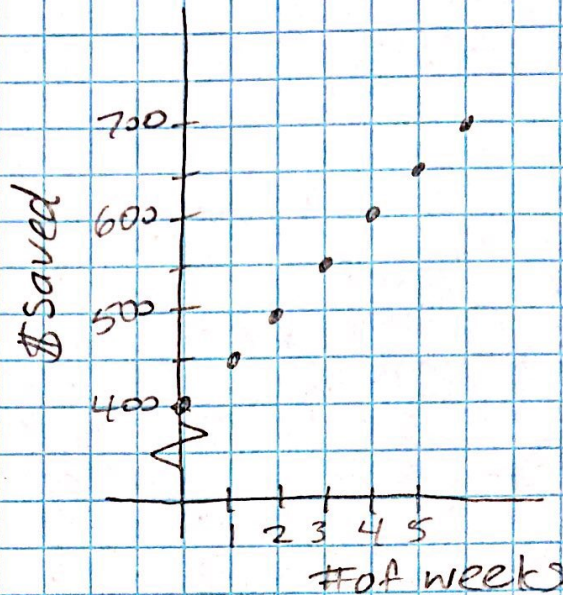
21)  $n = \# \text{ of weeks}$   
 $f(n) = \$ \text{ saved}$

$n$	$f(n)$
0	400
1	450
2	500
3	550
4	600

$$f(0) = 400$$

$$f(n) = f(n-1) + 50$$

$$f(n) = 400 + 50(n-1)$$



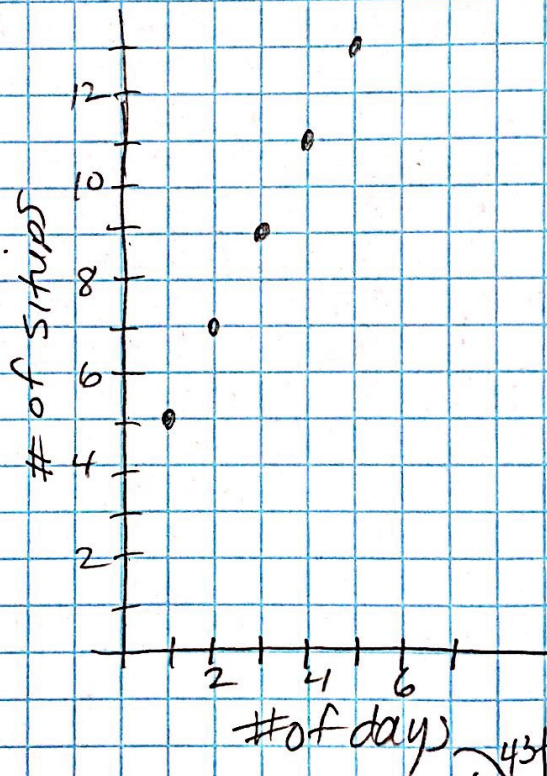
22)  $n = \# \text{ of days}$   
 $f(n) = \# \text{ of situps}$

$n$	$f(n)$
1	5
2	7
3	9
4	11
5	13
6	15

$$f(1) = 5$$

$$f(n) = f(n-1) + 2$$

$$f(n) = 5 + 2(n-1)$$



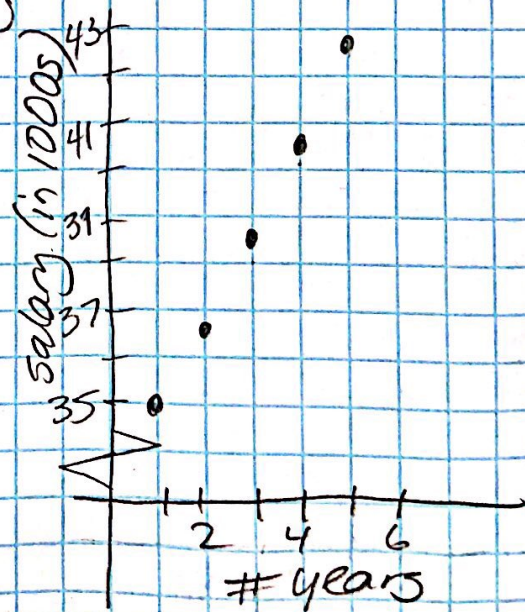
23)  $n = \# \text{ of years}$   
 $f(n) = \text{salary}$

$n$	$f(n)$
1	35000
2	36750
3	38587.50
4	40516.88
5	42542.72

$$f(1) = 35000$$

$$f(n) = 1.05 f(n-1)$$

$$f(n) = 35000 (1.05)^{n-1}$$





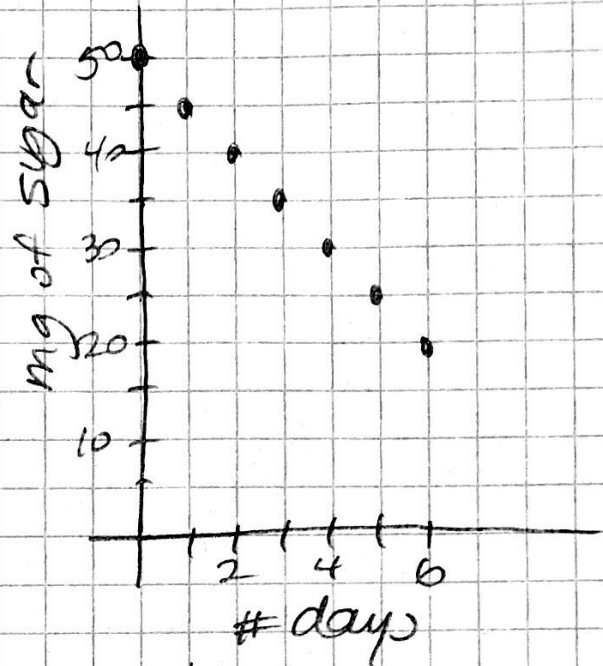
24)  $n = \# \text{ days}$   
 $f(n) = \text{amount of sugar}$

$n$	$f(n)$
0	50
1	45
2	40
3	35
4	30
5	25

$$f(0) = 50$$

$$f(n) = f(n-1) - 5$$

$$f(n) = 50 - 5(n-1)$$



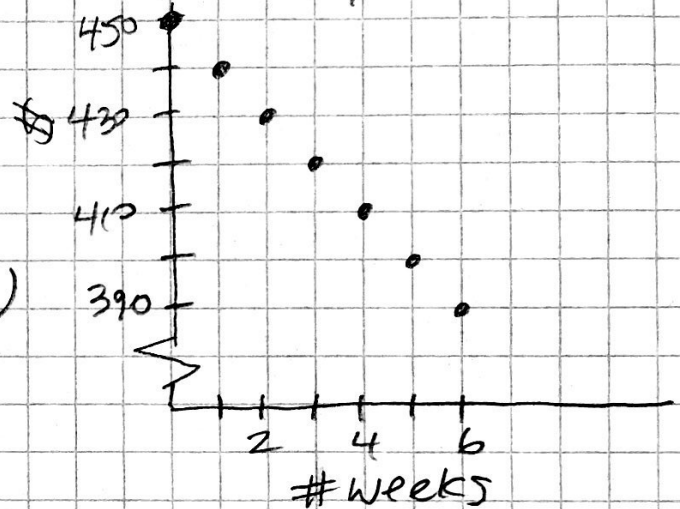
25)  $n = \# \text{ weeks}$   
 $f(n) = \$ \text{ in savings}$

$n$	$f(n)$
0	450
1	440
2	430
3	420
4	410
5	400

$$f(0) = 450$$

$$f(n) = f(n-1) - 10$$

$$f(n) = 450 - 10(n-1)$$



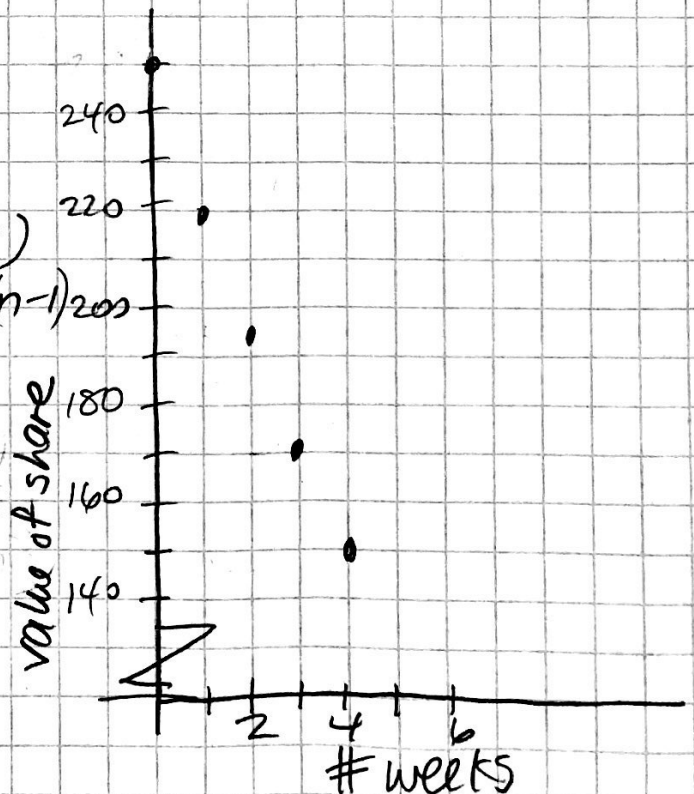
26)  $n = \# \text{ weeks}$   
 $f(n) = \text{value of share}$

$n$	$f(n)$
0	250
1	220
2	193.60
3	170.37
4	149.92

$$f(0) = 250$$

$$f(n) = 0.88f(n-1)$$

$$f(n) = 250(0.88)^{n-1}$$



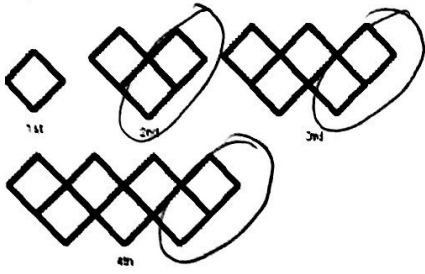
- 27) start with one diamond, then add 2
- a) diamonds on right end
  - b) arithmetic
  - c)  $d = 2$
  - d)  $f(n) = 1 + 2(n-1)$

- 28) start with one hexagon, then attach another
- a) 2 hexagons on left side, then 3 more then 4 more, increasing the number you add by 1 each time.
  - b) neither

- 30) start with 2 branches, then each branch
- a) gets 2 more branches on it so the number of branches will double
  - b) geometric
  - c)  $r = 2$
  - d)  $f(n) = 2 \cdot 2^{n-1}$

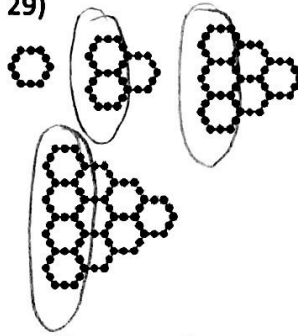
The first four figures of a picture pattern are shown. On a separate sheet of paper, a. Describe how each pattern is growing visually. b. Identify each sequence as arithmetic, geometric, or neither. c. If the sequence is arithmetic, identify the common difference; if the sequence is geometric, identify the common ratio. d. Write an explicit formula (if possible)

27)



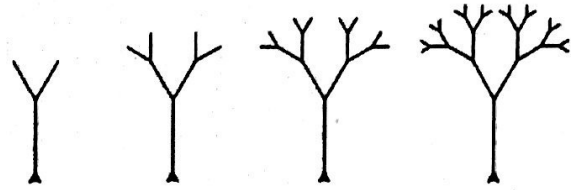
$n$  = figure number  
 $f(n)$  = number of diamonds

29)



$n$  = figure number  
 $f(n)$  = number of hexagons

30)



$n$  = figure number  
 $f(n)$  = number of branches

Choose the best answer.

31) A rabbit population starts with 10 rabbits and doubles each year for three years. How many rabbits will there be at the end of the three years?  $f(3) = 10(2)^3 = 80$

$f(n) = 10(2)^n$

A. 30

B. 80

C. 150

D. 630

0	1	2	3
10	20	40	80

32) A single bacterium lands in your mouth and starts growing by a factor of 4 every hour. After how many hours will the number of bacteria exceed 1,000?

$f(n) = 1 \cdot 4^n$

$1000 = 4^n$

A. One hour

B. Three hours

C. Five hours

D. Twenty hours

$4^1 = 4$

$4^3 = 64$

$4^5 = 1024$

02

0	1
1	4
2	16
3	64
4	256
5	1024

33) What is the recursive function that fits with the sequence shown in the graph below?

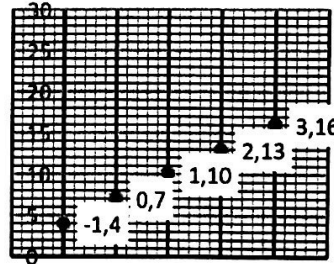
a.  $f(1) = 4, f(x) = f(x-1) \cdot 3$

b.  $f(1) = 4, f(x) = f(x-1) + 3$

c.  $f(0) = 4, f(x) = f(x-1) \cdot 3^x$

d.  $f(0) = 4, f(x) = f(x-1) + 3$

$f(-1) = 4$   
 $d = 3$



34) What is the explicit function that fits with the sequence shown in the graph below?

a.  $f(x) = 3x + 4$

b.  $f(x) = 3^x(4)$

c.  $f(x) = 3x + 5$

d.  $f(x) = 3^x(5)$

$f(0) = 5$   
 $r = 3$

