

Math 1A Unit 1, Part 1 Review Sheet

Name: Key

Show all work and answer all parts of every question!

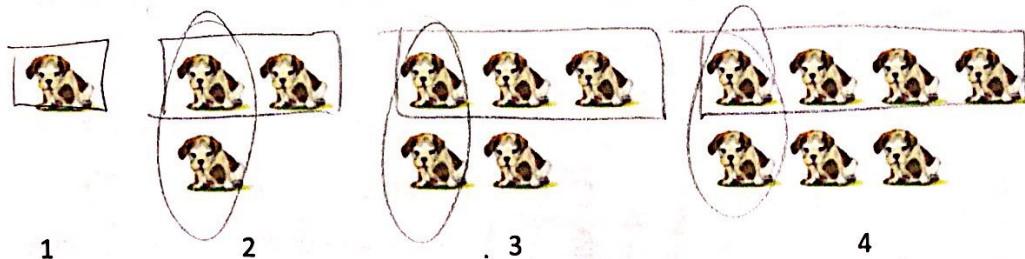
Complete the table below. Begin by determining if the sequence is arithmetic, geometric, or neither. If neither, you do not have to complete the rest of that row.

	First 5 terms	Next 3 terms	Arithmetic, geometric, or neither	Recursive equation	Explicit equation
1.	$1, 3, 6, 10, 15, \dots$ <small>$\times^2, \times^3, \times^4, \times^5, \times^6$</small>	21, 28, 36	N	X	X
2.	$7, 11, 15, 19, 23, \dots$ <small>$\times^4, \times^4, \times^4$</small>	27, 31, 35	A	$f(1) = 7$ $f(n) = f(n-1) + 4$	$f(n) = 7 + 4(n-1)$
3.	$-6, 4, 14, 24, 24, \dots$ <small>$\times^{10}, \times^{10}, \times^{10}$</small>	34, 44, 54	A	$f(1) = -6$ $f(n) = f(n-1) + 10$	$f(n) = -6 + 10(n-1)$
4.	$2, 12, 72, 432, 2592, \dots$ <small>$\times^6, \times^6, \times^6$</small>	15552, 93312, 559872	G	$f(1) = 2$ $f(n) = f(n-1) \cdot 6$	$f(n) = 2 \cdot 6^{(n-1)}$
5.	$-18, -15, -12, -9, -6$	-3, 0, 3	A	$f(1) = -18$ $f(n) = f(n-1) + 3$	$f(n) = -18 + 3(n-1)$
6.	$29, 229, 429, 629, 829$	1029, 1229, 1429	A	$f(1) = 29$ $f(n) = f(n-1) + 200$	$f(n) = 29 + 200(n-1)$
7.	$1, 6, 36, 216, 1296$	7776, 46656, 279936	G	$f(1) = 1$ $f(n) = f(n-1) \cdot 6$	$f(n) = 1 \cdot 6^{(n-1)}$
8.	$0.2, 1, 5, 25, 125$	625, 3125, 15625	G	$f(1) = 0.2$ $f(n) = f(n-1) \cdot 5$	$f(n) = 0.2(5)^{(n-1)}$
9.	$38, 47, 56, 65, 74$	83, 92, 101	A	$f(0) = 29$ $f(n) = f(n-1) + 9$	$f(n) = 29 + 9n$
10.	$4, 12, 36, 108, 324$	972, 2916, 8748	G	$f(1) = 4$ $f(n) = f(n-1) \cdot 3$	$f(n) = 4 \cdot 3^{(n-1)}$
11.	$120, 60, 30, 15, \frac{15}{2}$	$\frac{15}{4}, \frac{15}{8}, \frac{15}{16}$	G	$f(1) = 120$ $f(n) = f(n-1) \cdot \frac{1}{2}$	$f(n) = 120 \cdot \left(\frac{1}{2}\right)^{(n-1)}$
12.	$3, 12, 27, 48, 75$	X	N	X	$f(n) = 3n^2$

see separate paper!!!

For each of the following patterns, explain how you can describe the pattern visually. Be sure to explain what you see changing in the pictures or how you would count efficiently. Then make a table and a graph for the pattern on a separate sheet of paper (use graph paper!). Be sure to label the table and graph completely.

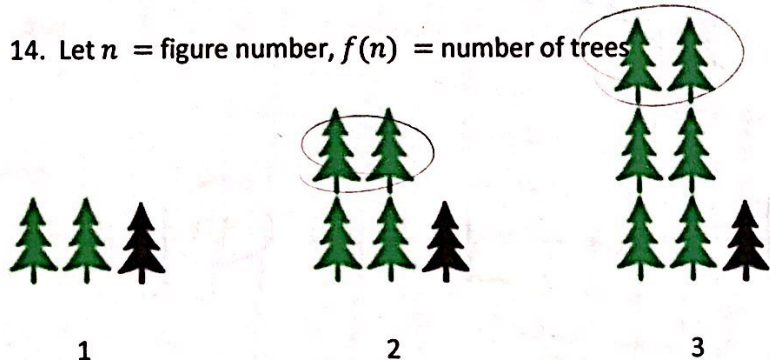
13. Let n = figure number, $f(n)$ = number of puppies



start with 1 puppy then add 2 more puppies on left end

OR
top row = figure number
plus bottom row = figure number - 1

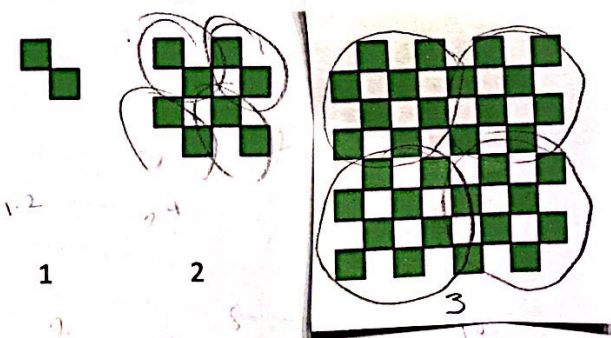
14. Let n = figure number, $f(n)$ = number of trees



start with 3 trees, then add 2 trees on top row

OR
2 green trees times figure number plus one black tree

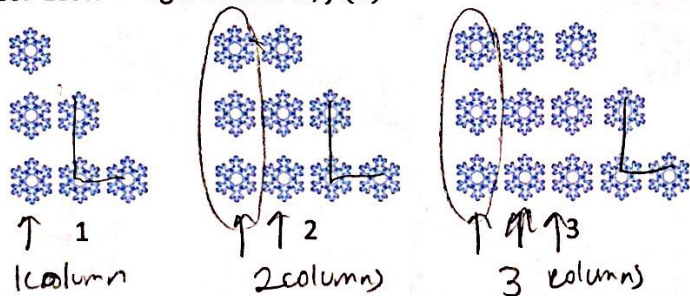
15. Let n = figure number, $f(n)$ = number of shaded squares



start with 2 squares, then repeat same pattern 4 times to make new, larger square

OR
start with 2 squares, then multiply by 4 to get next figure's # of squares

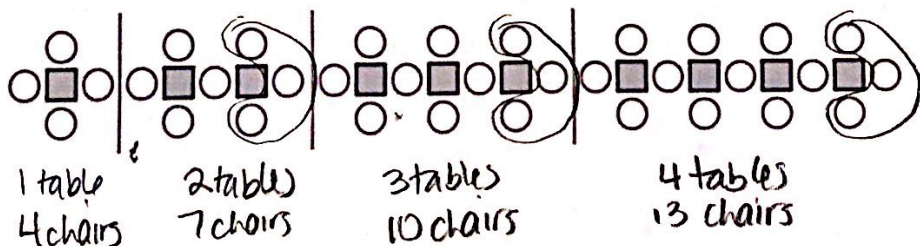
16. Let n = figure number, $f(n)$ = number of snowflakes



start with 6 snowflakes, then add 3 more on first column

OR
3 snowflakes times figure number plus 3 extra snowflakes on right

17. Let n = number of tables (squares), $f(n)$ = number of chairs (circles)

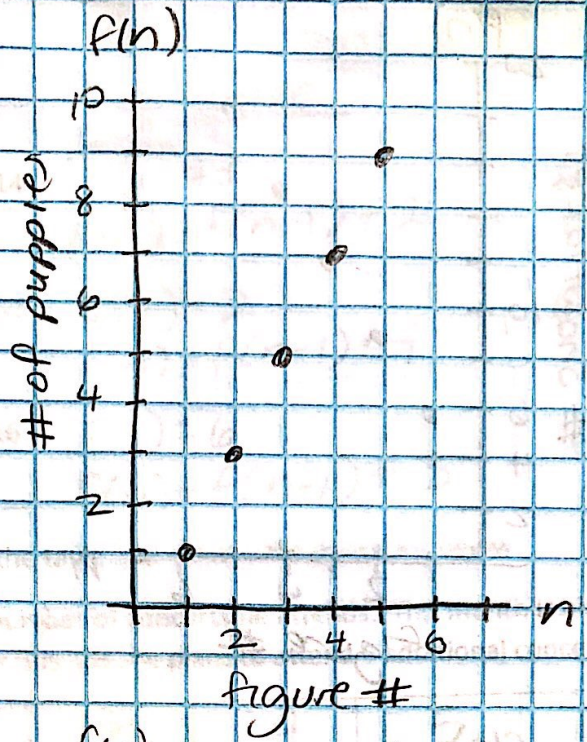


start with 1 table, 4 chairs add 3 more chairs every time you add a table

OR
3 chairs for every table plus 1 extra chair at end

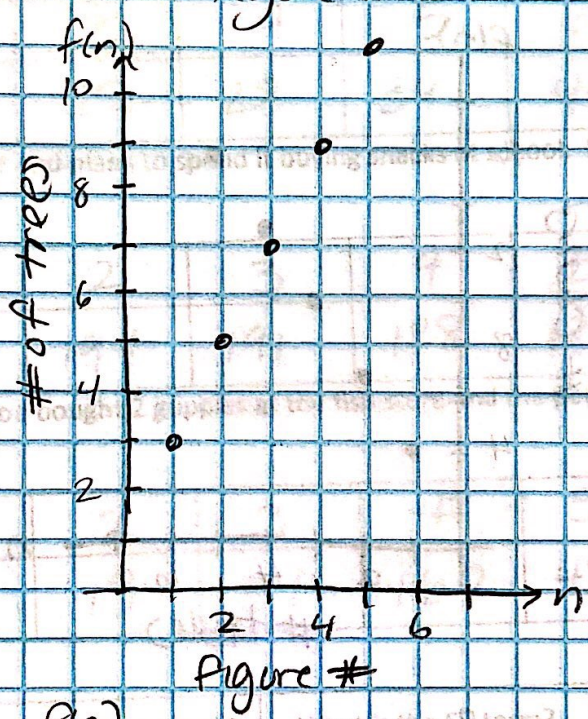
13

n	f(n)
1	1
2	3
3	5
4	7
5	9



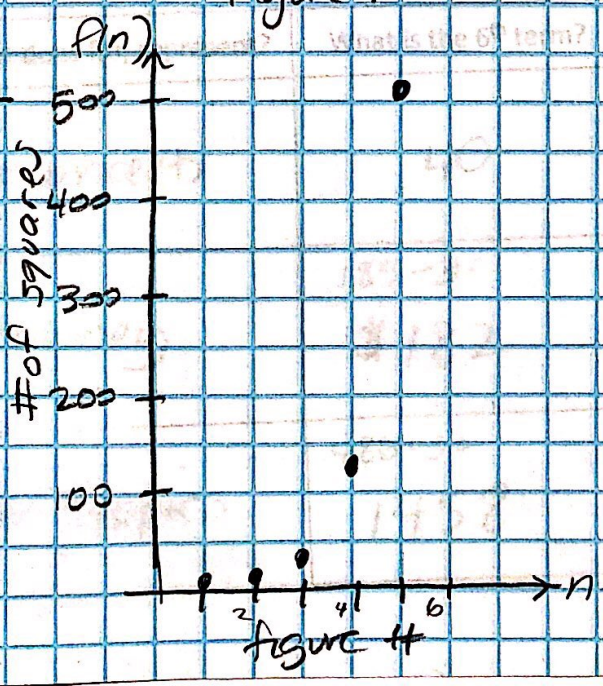
14

n	f(n)
1	3
2	5
3	7
4	9
5	11



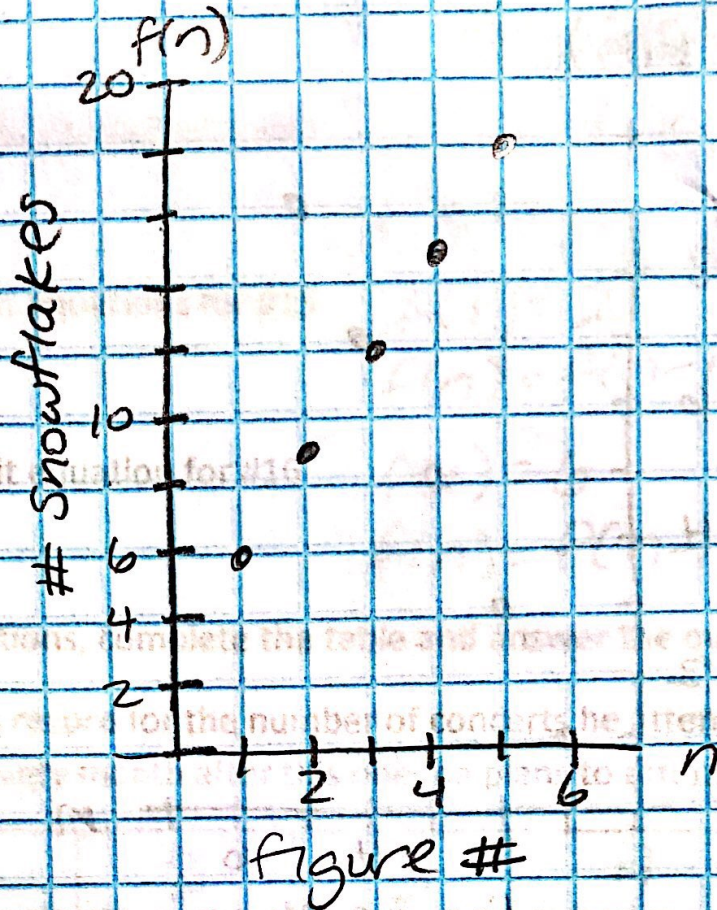
15

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



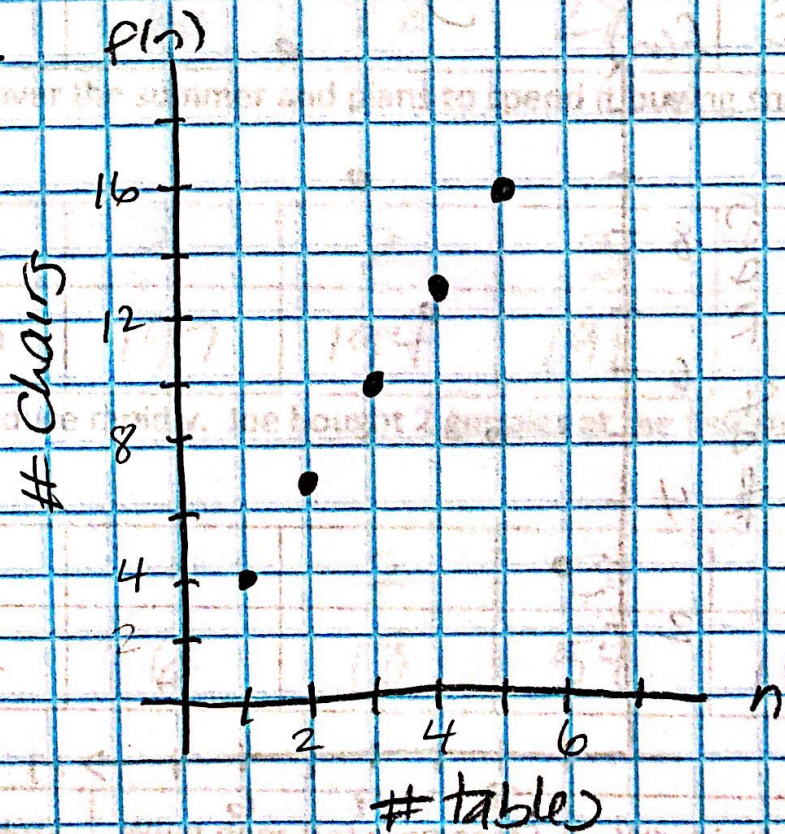
16

n	$f(n)$
1	6
2	9
3	12
4	15
5	18



17

n	$f(n)$
1	4
2	7
3	10
4	13
5	16



	<u>Recursive</u>	<u>Explicit</u>
18. Write recursive and explicit equations for #14 (trees!)	$f(1)=3$ $f(n)=f(n-1)+2$	$f(n)=3+2(n-1)$
19. Write recursive and explicit equations for #15 (squares)	$f(1)=2$ $f(n)=f(n-1)\cdot 4$	$f(n)=2\cdot 4^{(n-1)}$
20. Write recursive and explicit equation for #16 (snowflakes)	$f(1)=6$ $f(n)=f(n-1)+3$	$f(n)=6+3(n-1)$

For each of the following situations, complete the table and answer the questions below.

21. Jonah has plans to break a record for the number of concerts he attends. This month is his birthday month and he plans to attend 10 concerts. Every month after this one, he plans to attend 6 additional concerts.

months	n	1	2	3	4	5	6
concerts	$f(n)$	10	16	22	28	34	40

22. Selena has saved up \$200 over the summer and plans to spend it buying snacks at school. Every school day, she will spend \$3 on snacks.

school days	n	0	1	2	3	4	5
\$	$f(n)$	200	197	194	191	188	185

23. Guppies are fish that reproduce rapidly. Joe bought 2 guppies at the fish store and the population of guppies triples every week.

week	n	0	1	2	3	4	5
guppies	$f(n)$	2	6	18	54	162	486

Prob #	What does n represent?	What does $f(n)$ represent?	What is the 6 th term?	What is the 20 th term?
21	# months	# concerts	40	$10 + 6(19) = 124$
22	# school days	# money	$185 - 3 = \$182$	$200 - 3(20) = \$140$
23	# weeks	# guppies	$486 \cdot 3 = 1458$	$2 \cdot 3^{20} = 6,973,568,802!$

Evaluate each expression. Show all work.

24. $\frac{6}{5+(6-5)^2}$
 $\frac{6}{5+(1)^2} = \frac{6}{5+1} = \frac{6}{6} = 1$

25. $5-5+(5)(3+1)$
 $5-5+5(4)$
 $5-5+20$
 $0+20 = 20$

26. $1-\left(\frac{15+5}{5}-4\right)$
 $1-\left(\frac{20}{5}-4\right)$
 $1-(4-4)$
 $1-0 = 1$

27. $6(2+4)-(6+5)$
 $6(6)-(11) = 36-11 = 25$

Evaluate each expression using the given values. Show all work.

28. $(y)(x+x)-(z+z)$; use $x=3$, $y=5$, and $z=6$
 $5(3+3)-(6+6)$
 $5(6)-(12)$
 $30-12 = 18$

29. $(y-4)(zy-x)$; use $x=4$, $y=6$, and $z=3$
 $(6-4)(3(6)-4)$
 $2(18-4)$
 $2(14) = 28$

30. $h+h-\left(\frac{k}{6}\right)^2$; use $h=6$, and $k=6$
 $6+6-\left(\frac{6}{6}\right)^2 = 6+6-(1)^2$
 $= 6+6-1 = 12-1 = 11$

31. $y-\left(y-\frac{zx}{5}\right)$; use $x=5$, $y=6$, and $z=5$
 $6-\left(6-\frac{5(5)}{5}\right) = 6-\left(6-\frac{25}{5}\right)$
 $= 6-(6-5) = 6-(1) = 5$

32. $(yx)\left(\frac{4x}{4}\right)$; use $x=5$, and $y=2$
 $2(5)\left(\frac{4(5)}{4}\right)$
 $2(5)\left(\frac{20}{4}\right)$
 $2(5)(5) = 10(5) = 50$

33. $5+(h)(4+k)+j$; use $h=4$, $j=3$, and $k=5$
 $5+(4)(4+5)+3$
 $5+4(9)+3$
 $5+36+3$
 $41+3 = 44$

Evaluate the given function for the indicated function values. Show all work.

$f(n) = 5n - 8$

$g(n) = 3(n-1) + 2$

$h(n) = 4 \cdot 3^{(n-1)}$

34. $f(3) = 7$
 $5(3) - 8 = 15 - 8$

35. $g(5) = 14$
 $3(5-1) + 2 = 3(4) + 2$
 $= 12 + 2$

36. $h(4) = 108$
 $4 \cdot 3^{(4-1)} = 4 \cdot 3^3$
 $= 4 \cdot 27$

37. $f(20) = 92$
 $5(20) - 8$
 $100 - 8$

38. $h(3) = 36$
 $4 \cdot 3^{(3-1)} = 4 \cdot 3^2$
 $= 4 \cdot 9$

39. $g(100) = 299$
 $3(100-1) + 2$
 $3(99) + 2$
 $297 + 2$

40. $f(-6) = -38$
 $5(-6) - 8$
 $-30 - 8$

41. $g(7) = 20$
 $3(7-1) + 2$
 $3(6) + 2$
 $18 + 2$