

first/last name: _____

Key

Period: _____

Practice

1. Decide whether each sequence below is *arithmetic*, *geometric*, or *neither*.

- a) -2, 2, 6, 10, ~~Arithmetic~~ Arithmetic
- b) 2, 5, 16, Neither
- c) 4, 8, 16, 32, Geom

$$t_n = -9 + 3(n)$$

or

$$t_n = -6 + 3(n-1)$$

[3 marks]

2. For the sequence: -6, -3, 0, 3, Write the following:

a) An *explicit* formula using " $t_n =$ " using either zero or first term format: ①

b) Find the 66th term of the sequence using your *explicit* formula. show work. [2 marks]

$$t_{66} = -6 + 3(66-1) = \underline{\underline{189}}$$

3. David Bowie wrote the equation $t(n) = 20 + 4n$ for a sequence he was thinking about. Is it possible that 928 is part of his sequence? *yes or no? Explain/show why or why not using the formula.* [3 marks]

$$928 = 20 + 4n$$

$$-20 \quad -20$$

$$908 = 4n$$

$n = 227$ is a whole so

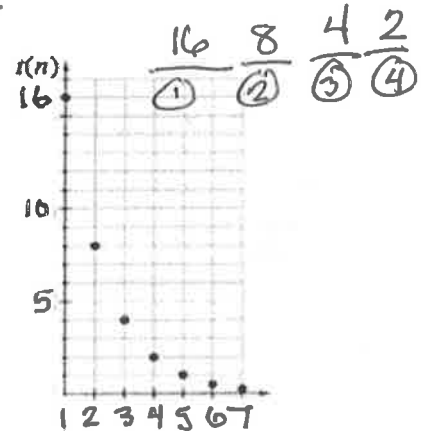
928 is a term.

4. A sequence is shown in the graph.

a) Write an explicit formula. $t_n = 16\left(\frac{1}{2}\right)^{n-1}$ [3 marks]
or $t_n = 32\left(\frac{1}{2}\right)^n$

b) Find t_8 , and round it to 4 decimal places. [1 mark]

$$t_8 = 16\left(\frac{1}{2}\right)^{8-1} = \underline{\underline{0.1250}}$$



5. Complete the table. Then Write a function $y = ab^x$ that represents the graph shown. Show work for full credit. [3 marks]

$$\frac{28.83}{9.3} = 3.1$$

$$\frac{9.3}{3} = 3.1$$

x	y
0	3
1	9.3
2	28.83
3	

$$y = 3(3.1)^x$$

6. Complete the table to the right. Also, write an exponential function in the form $y = ab^x$. [3 marks]

x	Y
0	25
1	35
2	49
3	68.6

$$y = 25(1.4)^x$$

$$25 \cdot b \cdot b = 49 \rightarrow b^2 = \frac{49}{25}$$

$$25 b^2 = 49 \rightarrow \sqrt{\quad} \sqrt{\quad}$$

$$b = 1.4$$

7. A new car is purchased for \$32,000. The car will lose 20% of its value every year.

a. Write an exponential function in the form, $y = ab^x$ to model the situation.

$$y = 32000(0.8)^x$$

b. Calculate the value of the car after 10 years. [3 marks]

$$y = 32000(0.8)^{10} = \$3435.97$$

is the value after 10 years

100% - 20% = 80% = 0.8 multiplier

8. The population of rare yellow-green ducks in a town called Neugene is 750. Their population is growing at a rate of 8% a year.

Write and use an exponential function in the form, $y = ab^x$, to calculate this duck population in 14 years. show work and round answer to 2 decimal places. [3 marks]

100% + 8% = 108% = 1.08 multiplier

$$y = 750(1.08)^x$$

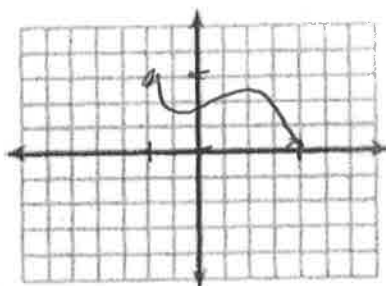
$$y = 750(1.08)^{14}$$

$$y = 2202.8952...$$

about 2,203.90 DUCKS

9. Sketch a graph with a domain of $-2 \leq x \leq 4$ and a range of $0 \leq y \leq 3$

for example



10. Use your graphing calculator to help determine the domain and range of the following function:

$$f(x) = x^2 - 5$$



domain $-\infty < x < \infty$

range $-5 \leq y < \infty$

11. Factor each expression completely:

$$5n^2 - 20$$

$$8x^3 + 19x^2 + 6x$$

$$\rightarrow x(8x^2 + 19x + 6)$$

$$x(x+2)(8x+3)$$

$5(n^2 - 4)$
 difference of squares
 $5(n+2)(n-2)$

	x	2	
$8x$	$8x^2$	$16x$	$48x$
3	$3x$	6	$19x$

$2x$	$24x$
$3x$	$16x$
$4x$	$12x$
$6x$	$8x$

12. Simplify each. (there should be no negative exponents in your answer)

$$(y^3)^4$$

y^{12}

$$n^4 \cdot n^5$$

n^9

$$x^3 \cdot x^{-6}$$

$$x^{-3}$$

↓

$\frac{1}{x^3}$

$$(2n^4)^3$$

$$2^3 \cdot (n^4)^3$$

↓

$8n^{12}$

$$\frac{2x^2y^8}{8x^5y^3}$$

$\frac{5y}{4x^3}$