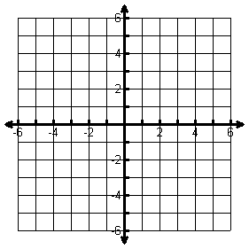
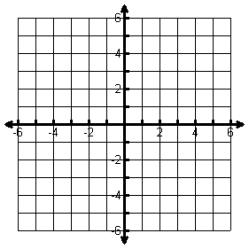
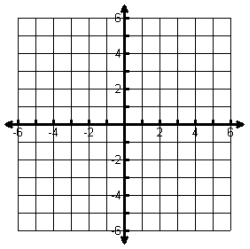
GSE Algebra 1 Unit 5 Study Guide

Name: _____ Date: _____

Use the following to review for you test. Work the Practice Problems on a separate sheet of paper.

What you need to know & be able to do	Things to remember	Problem	
<u>Characteristics of Functions</u>	• Domain (x-values) • Range (y-values) • Y-int (where it crosses the y-axis) • X-int (where it crosses the x-axis) • Asymptote • Rate of Change • Increasing/ Decreasing • End behavior	1. Graph the funtion $f(x) = (2)^x - 3$ 	What type of function is this? _____ Domain: _____ Range:_____ Asymptote: _____ RoC from x = 0 to 1: _____ X-Int:_____ Y-Int: _____ Inc:_____ Dec:_____ End behavior: $x \to -\infty, f(x) \to$ ___ $x \to \infty, f(x) \to$ ___
		2. Graph the function $y = -3x + 6$ 	What type of function is this? _____ Domain: _____ Range:_____ Asymptote: _____ RoC from x = 0 to 1: _____ X-Int:_____ Y-Int: _____ Inc: _____ Dec:_____ End behavior: $x \to -\infty, f(x) \to$ ___ $x \to \infty, f(x) \to$ ___
		3. Graph the function $f(x) = 2(x-1)^2 - 3$ 	What type of function is this? _____ Domain: _____ Range:_____ Asymptote: _____ RoC from x = 0 to 1: _____ X-Int:_____ Y-Int: _____ Inc: _____ Dec:_____ End behavior: $x \to -\infty, f(x) \to$ ___ $x \to \infty, f(x) \to$ ___

<table>
<tr>
<td rowspan="2"><u>Comparing Functions</u></td>
<td rowspan="2">
• Starting value= Function
• LInear $y = mx + b$
• Exponential $y = ab^x$
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4. Taylor and Jordan are competing to see who can run the most during a week. On Day 1, they both run 3 miles. Taylor then increases his mileage each day by 2 miles. Jordan runs 1.5 times as many miles each day.

Write the rule for the sequence that represents how many miles each runner will run in terms of days.
<u>Taylor:</u>

<u>Jordan:</u>

Who will reach 10 miles first?
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5. Two companies are offering memberships for buying music. iTunes offers a $20 a month membership with a registration fee of $100. Amazon offers a $40 a month membership with a registration fee of $60.
Write an equation for each company.
<u>iTunes:</u>

<u>Amazon:</u>

Compare the rates of change and the y-intercepts.

Which company is better if you only want 2 months? 12 months?
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<tr>
<td><u>Determine whether a function is even, odd, or neither</u></td>
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• Graphically:
• A function is even when it is symmetrical about the y-axis
• A function is odd if you can rotate it 180 degrees and have the same graph (it also must go through the origin)

• Algebraically:
• A function is even if ALL the exponents are even
• A function is odd if ALL the exponents are odd
• Remember constants have x^0-- EVEN
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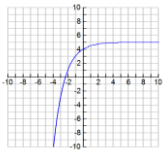
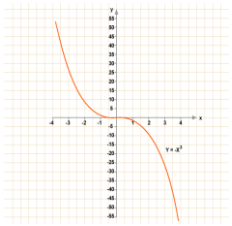
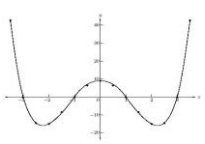
6. Determine whether the function is even, odd or neither.
 _____

 _____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7.
$f(x) = 2x^3$

$f(x) = -x^3 + x + 5$

$f(x) = x^4 + 3x$

$f(x) = x^2 - 9$
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Sequences: **Arithmetic and Geometric**	**Arithmetic** • Common difference, add or subtract by the same number • $A_n = dn + a_0$ OR $A_n = a_1 + d\,(n - 1)$ **Geometric** • Each term is multiplied by a common ratio • $A_n = a_1\,(r)^{n-1}$	Write the equation for the sequence 8) 12, 16, 20, 24…. 9) 120, 60, 30, 15… 10) 21, 18, 15, 12… 11) 12, 24, 48…	Find the indicated term: 12) $A_n = 6n + 5$ Find a_{11} 13) $A_n = \frac{1}{2}\,(4)^{n-1}$ Find a_{15}

The tables below each represent a different function. Use these functions to answer questions 14- 19.

f(x)

x	-2	-1	0	1	2
f(x)	9	5	1	-3	-7

g(x)

x	-2	-1	0	1	2
f(x)	0.25	1	4	16	64

h(x)

x	-2	-1	0	1	2
f(x)	5	3	3	5	9

_____ 14) What is the equation of the exponential function?

_____15) Be able to pick the quadratic equation from multiple choice

_____ 16) What is the equation of the linear function?

_____ 17) If m(x) = g(x) - 4, what is m(x)?

_____ 18) Which function has a common difference?

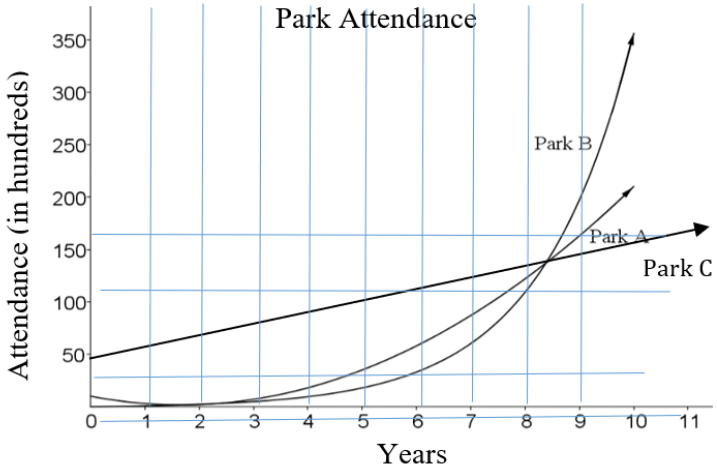
_____ 19) Which function has a common ratio?

Directions: Use the graph to the right to select the best answer for questions 20-22.

_____ 20) After how many years does Park A's attendance exceed park C.

_____ 21) Which park has the highest attendance the 8th year?

_____ 22) When do all 3 parks have the same attendance?



Rate of Change:

23) If $k(x) = 4^{x+3} + 2$, what is the average rate of change for the interval $-2 \leq x \leq 1$?

24) What is the average rate of change over the interval [3, 7] for $\boldsymbol{f(x) = (x-3)^2 + 4}$.

25) Find the rate of change for $\boldsymbol{g(x) = 2x - 4}$ over the interval [-1, 3].