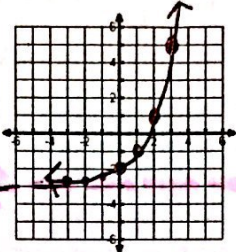
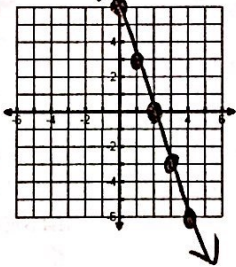
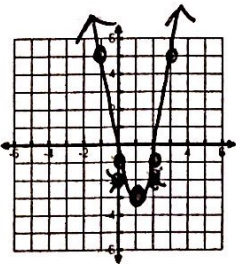


Name: _____

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	
<p>Characteristics of Functions</p> <ul style="list-style-type: none"> • 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 	<p>• Sloping values function</p> <p>• Linear $y = mx + b$</p> <p>• Exponential $y = ab^x$</p>	<p>1. Graph the function $f(x) = (2)^x - 3$</p> 	<p>What type of function is this? <u>Exponential</u></p> <p>Domain: <u>\mathbb{R}</u> Range: <u>$(-3, \infty)$</u></p> <p>Asymptote: <u>$y = -3$</u></p> <p>RoC from $x = 0$ to 1: <u>1</u></p> <p>X-Int: <u>$\approx (1.7, 0)$</u> Y-Int: <u>$(0, -2)$</u></p> <p>Inc: <u><input checked="" type="checkbox"/></u> Dec: <u>_____</u></p> <p>End behavior: $x \rightarrow -\infty, f(x) \rightarrow -3$ $x \rightarrow \infty, f(x) \rightarrow \infty$</p>
		<p>2. Graph the function $y = -3x + 6$</p> 	<p>What type of function is this? <u>Linear</u></p> <p>Domain: <u>\mathbb{R}</u> Range: <u>\mathbb{R}</u></p> <p>Asymptote: <u>none</u></p> <p>RoC from $x = 0$ to 1: <u>-3</u></p> <p>X-Int: <u>$(2, 0)$</u> Y-Int: <u>$(0, 6)$</u></p> <p>Inc: <u>_____</u> Dec: <u><input checked="" type="checkbox"/></u></p> <p>End behavior: $x \rightarrow -\infty, f(x) \rightarrow \infty$ $x \rightarrow \infty, f(x) \rightarrow -\infty$</p>
		<p>3. Graph the function $f(x) = 2(x-1)^2 - 3$</p>  <p style="text-align: center;"> $\begin{array}{c} \text{dec} \quad \quad \text{inc} \\ \hline -\infty \quad \quad 1 \quad \infty \end{array}$ </p>	<p>What type of function is this? <u>quadratic</u></p> <p>Domain: <u>\mathbb{R}</u> Range: <u>$[-3, \infty)$</u></p> <p>Asymptote: <u>none</u></p> <p>RoC from $x = 0$ to 1: <u>-2</u></p> <p>X-Int: <u>$\approx (2.2, 0)$</u> Y-Int: <u>$(0, -1)$</u></p> <p>Inc: <u>$(1, \infty)$</u> Dec: <u>$(-\infty, 1)$</u></p> <p>End behavior: $x \rightarrow -\infty, f(x) \rightarrow \infty$ $x \rightarrow \infty, f(x) \rightarrow \infty$</p>

Comparing Functions

- Starting value= Function
- Linear $y = mx + b$
- Exponential $y = ab^x$

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.

Taylor: 3, 5, 7, 9, ... $a_n = 3 + 2(n-1)$
 $= 3 + 2n - 2$

Jordan: 3, 4.5, 6.75, ... $a_n = 2n + 1$
 $a_n = 3(1.5)^{n-1}$

Who will reach 10 miles first? Jordan

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.

iTunes: $y = 20x + 100$

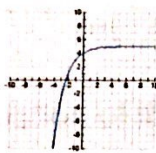
Amazon: $y = 40x + 60$

Compare the rates of change and the y-intercepts.
 Amazon has a higher ROC than iTunes
 iTunes has a larger y-int than Amazon
 Which company is better if you only want 2 months? 12 months?
 2 months: Same 12 months: iTunes

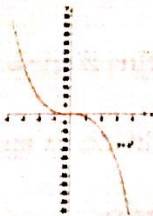
Determine whether a function is even, odd, or neither

- 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

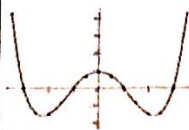
6. Determine whether the function is even, odd or neither.



neither



odd



even

7.

$f(x) = 2x^3$ odd

$f(x) = -x^3 + x^1 + 5x^0$ neither

$f(x) = x^4 + 3x^1$ neither

$f(x) = x^2 - 9x^0$ even

<p>Sequences:</p> <p>Arithmetic and Geometric</p>	<p>Arithmetic</p> <ul style="list-style-type: none"> Common difference, add or subtract by the same number $A_n = dn + a_0$ OR $A_n = a_1 + d(n - 1)$ <p>Geometric</p> <ul style="list-style-type: none"> Each term is multiplied by a common ratio $A_n = a_1 (r)^{n-1}$ 	<p>Write the equation for the sequence</p> <p>8) 12, 16, 20, 24... $12 + 4(n-1)$ $+4$ $12 + 4n - 4$</p> <p>$a_n = 4n + 8$</p> <p>9) 120, 60, 30, 15...</p> <p>$a_n = 120(\frac{1}{2})^{n-1}$</p> <p>10) 21, 18, 15, 12... $21 - 3(n-1)$ $21 - 3n + 3$</p> <p>$a_n = -3n + 24$</p> <p>11) 12, 24, 48...</p> <p>$a_n = 12(2)^{n-1}$</p>	<p>Find the indicated term:</p> <p>12) $A_n = 6n + 5$ Find a_{11}</p> <p>$= 6(11) + 5$</p> <p>$a_{11} = 71$</p> <p>13) $A_n = \frac{1}{2}(4)^{n-1}$ Find a_{15}</p> <p>$a_{15} = \frac{1}{2}(4)^{15-1}$</p> <p>$134,217,728$</p>
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The tables below each represent a different function. Use these functions to answer questions 14- 19.

$f(x)$ Linear

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

-4 -4 -4 -4

exponential $g(x)$

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

.4 .4 .4

quadratic $h(x)$

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

$g(x) = 4(4)^x$ 14) What is the equation of the exponential function?

$h(x)$ is quadratic 15) Be able to pick the quadratic equation from multiple choice

$f(x) = -4x + 1$ 16) What is the equation of the linear function?

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

$f(x)$ 18) Which function has a common difference?

$g(x)$ 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.

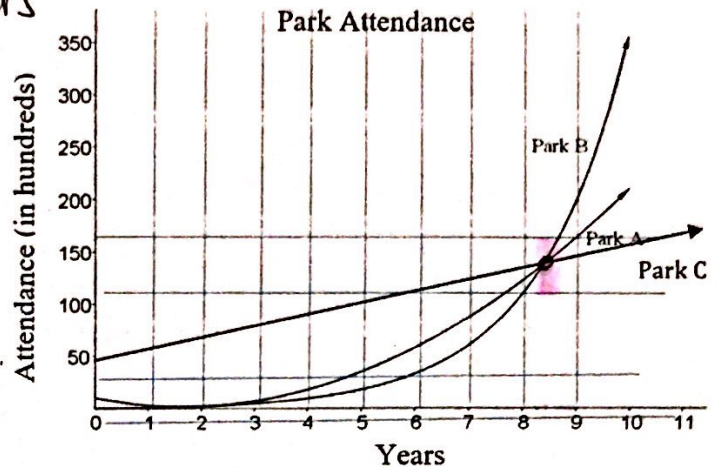
After about 8.25 years

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

Park C

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

about 8.25 years



Rate of Change:

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

$(-2, 6)$
 $(1, 258)$

$$\frac{258 - 6}{1 - (-2)} = \frac{252}{3}$$

$\boxed{84}$

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

$(3, 4)$
 $(7, 20)$

$$\frac{20 - 4}{7 - 3} = \frac{16}{4} = \boxed{4}$$

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

$(-1, -6)$
 $(3, 2)$

$$\frac{2 - (-6)}{3 - (-1)} = \frac{8}{4} = \boxed{2}$$