Sec I – Term 3 Name_____ ID: 1

Notes: T3-51 Writing Exp Equations Date_____Period_____

Write an Equation from a Table

Linear Functions $f(x) = mx + b$ or Exponential Functions $f(x) = a \cdot b^x$

First determine a) if it is ***rate of change*** (Linear) where is add or subtract the same each time or
b) is it a ***factor of change*** (Exponential) where it multiplies each time.

x	$f(x)$
0	5
1	9
2	13
3	17

+4, +4, +4

$f(x) = \frac{4}{1}x + 5$

x	$f(x)$
0	1
1	2
2	4
3	8

·2 +1, ·2 +2

$f(x) = 1(2)^x$

x	$f(x)$
-1	2
0	6
1	18
2	54

·3, ·3, ·3

$f(x) = 6(3)^x$

Determine if the following tables represent a linear function, an exponential function, or neither. If the function is linear or exponential, write the equation.

x	$f(x)$
0	3
1	9
2	15
3	21
4	27

+1, +1, +1, +6, +6, +6

$f(x) = \frac{6}{1}x + 3$

x	$f(x)$
-1	5
0	10
1	30
2	60
3	80

$f(x) =$ NOPE

x	$f(x)$
0	3
1	9
2	27
3	81
4	243

+1, ·3, ·3, ·3

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

x	$f(x)$
-2	625
-1	125
0	25
1	5
2	1

÷5 = ·$\frac{1}{5}$, ·$\frac{1}{5}$, ·$\frac{1}{5}$, ·$\frac{1}{5}$

$f(x) = 25(\frac{1}{5})^x$

x	$f(x)$
0	0.25
1	.5
2	1
3	2
4	4

+.25, •50, •2 +1, •2, •2

$f(x) = .25(2)^x$

x	$f(x)$
-1	-8
0	-6
1	-4
2	-2
3	0

+2

$f(x) = 2x - 6$

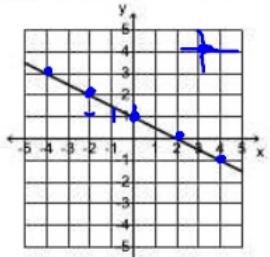
Write an Equation from a Graph

Linear Functions $f(x) = mx + b$

Need: $f(x) = -\frac{1}{2}x + 1$

$b = 1$

$m = \frac{-1}{2}$



D: R:

Exponential Functions $f(x) = a \cdot b^x$

Need: $f(x) = 2(3)^x$

$f(x) = 4\left(\frac{1}{2}\right)^x$

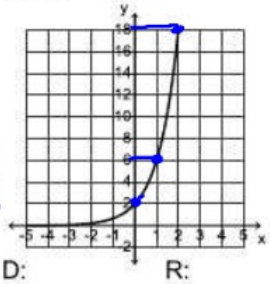
.3 18

.3 6

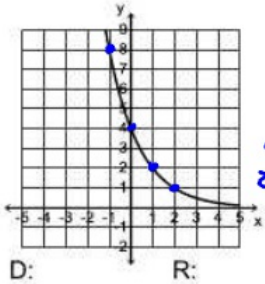
.3 2

$a = 2$

$b = 3$



D: R:



D: R:

8 ÷2

4 ÷2

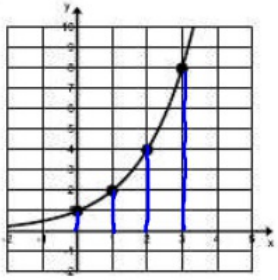
2

1

$a = 4$

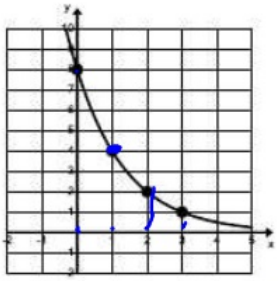
$b = \frac{1}{2}$

$f(x) = 1(2)^x$



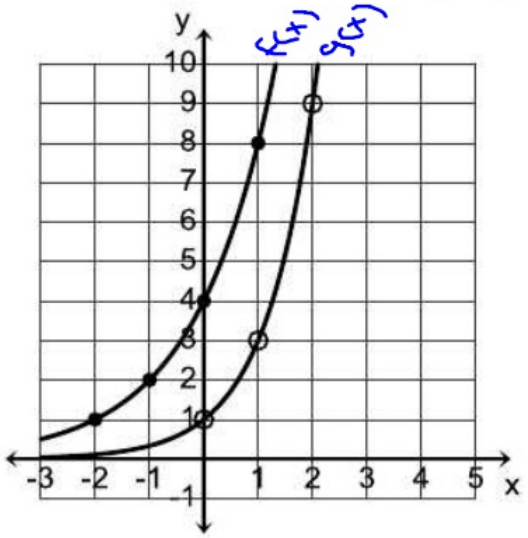
x	f(x)
0	1
1	2
2	4
3	8

$f(x) = 8\left(\frac{1}{2}\right)^x$



x	f(x)
0	8
1	4
2	2
3	1

Use the graph below to answer the questions.



1. Write the equation for the graph that passes through the solid dots.
   $f(x) = 4(2)^x$

2. Write the equation for the graph that passes through the empty dots.
   $g(x) = 1(3)^x$

3. Find the ***rate of change*** (Linear) for the given intervals.

$\frac{y_2 - y_1}{x_2 - x_1}$

$f(x)$	$g(x)$
[-1, 1] $= 3$	[0, 1]
$\frac{8-2}{1+1} = \frac{6}{2}$ (-1,2) (1,8)	
[-2, 0]	[1, 2]

(-2,1) (0,4)

$\frac{1-4}{-2-0} = \frac{-3}{-2} = \frac{3}{2}$

4. Which has a greater ***rate of change*** (Linear)?
   $[-2, 1]$ for $f(x)$ OR $[0, 2]$ for $g(x)$

Sec I – Term 3 Name_____ ID: 1

WS: T3-51 Writing Exp Equations Date_____Period_____

Determine if the following tables represent a linear function $\left(f(x)=mx+b\right)$, an exponential function $\left(f(x)=a\cdot b^{x}\right)$, or neither. If the function is linear or exponential, write the equation.

1. f(x) =

x	*f(x)*
0	2
1	8
2	32
3	128
4	512

2. f(x) =

x	*f(x)*
0	15
1	10
2	5
3	0
4	-5

3. f(x) =

x	*f(x)*
0	0
1	5
2	20
3	45
4	80

Write an exponential equation, $f(x)=a\cdot b^{x}$, using the given information.

4. $f(x)=$

x	*f(x)*
0	3
1	15
2	75
3	375

5. $f(x)=$

x	*f(x)*
-1	80
0	40
1	20
2	10

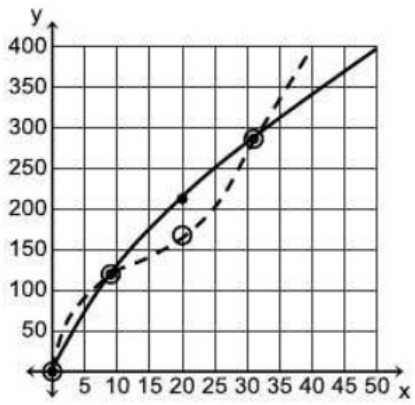
6. $f(x)=$

x	*f(x)*
0	3
1	1
2	$\frac{1}{3}$
3	$\frac{1}{9}$

7. $f(x)=$

x	*f(x)*
-2	3
-1	6
0	12
1	24
2	48

Below is the graph of two runners as they run a 400 meter hurdles race. Runner A is the solid line going through the solid circles and runner B is the dashed line going through the open circles.



Time	Runner A	Runner B
0	0	0
9	120	120
20	168	213
31	287	287

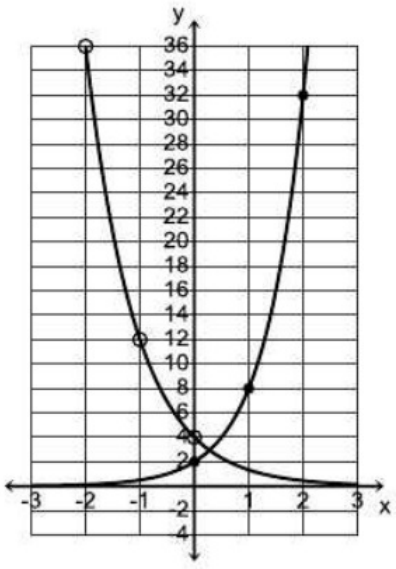
8. Which runner has a faster average speed for the domain $[0, 9]$?

9. Which runner has a faster average speed for the domain $[9, 31]$?

10. Which runner has a faster average speed for the domain $[31, 50]$?

11. Who wins the race? How do you know?

Use the graph below to answer the questions.



12. Write the equation for the graph that passes through the solid dots. State the domain and range.

$f(x) =$

D: R:

13. Write the equation for the graph that passes through the empty dots. State the domain and range.

$g(x) =$

D: R:

14. Which has a greater rate of change?

$[-2, 0]$ for $f(x)$

OR

$[-1, 0]$ for $g(x)$