Name: _____ Date: _____

6.1 The Exponential Function and Its Inverse

BLM 6–2

1. a) Which of the following is an exponential function? Explain how you know.

i)

x	*y*
1	2
2	8
3	18
4	32

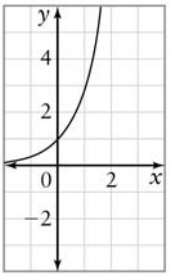
ii)

x	*y*
1	5
2	25
3	125
4	625

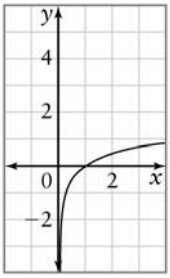
b) Write an equation for the data that is exponential.

2. Match each graph a), b), and c) with its inverse i), ii), or iii). Then, write an equation for each function in the left column.

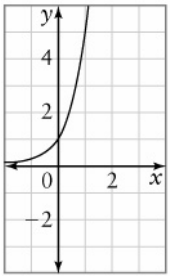
a)



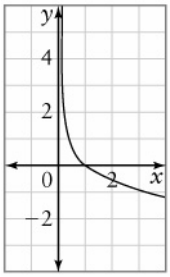
i)



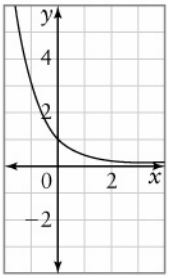
b)



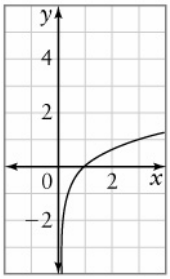
ii)



c)



iii)



3. Complete the table of key features for $f(x)$ and its inverse.

	$f(x)=\left(\frac{1}{2}\right)^x$	**Inverse of *f***
Domain		
Range		
***x*-intercept**		
***y*-intercept**		
Intervals for which *f*(*x*) is positive		
Intervals for which *f*(*x*) is increasing		
Equation of asymptote		

4. The deeper you are under water, the less sunlight reaches you. The percent of sunlight, P, that reaches a depth d, in metres, can be modelled by the function $P(d)=100(0.85)^d$.

a) Sketch a graph of P for the interval [0, 10].

b) Sketch the inverse of P.

c) Use your graph of the inverse of P to determine the depth at which the percentage of sunlight is 50%. Test your value for depth in the original equation for P.

d) Use your graph of P to calculate the average rate at which the sunlight is absorbed over the first 5 m.

e) Is the instantaneous rate at which sunlight is absorbed at a depth of 5 m greater than your answer in part d)? Explain.

5. Use Technology Use *The Geometer's Sketchpad*® to construct the graph of $y = b^x$ and its inverse, where b is a parameter with least value 1.

a) As the value of b increases from 1 to 2, what happens to the rates of change of the functions?

b) Estimate the value of b for which $y = b^x$ and its inverse have only one point of intersection.