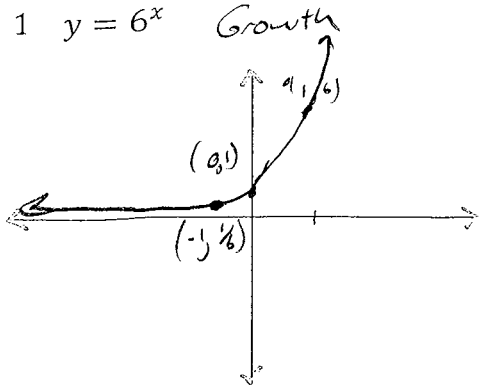
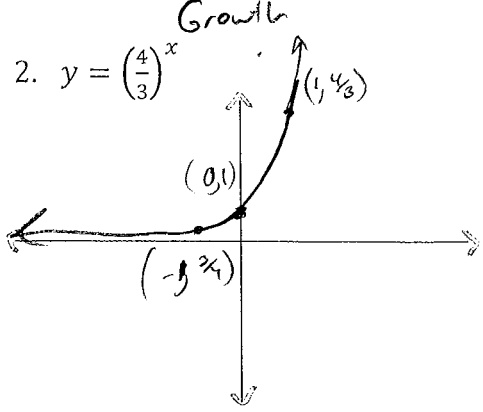
ASSIGNMENT: 6.1 Part 1 – Exponential Growth and Decay Name: Key

For #1 – 6, tell whether the function represents exponential growth or exponential decay. Then graph the function. Include at least 2 points.

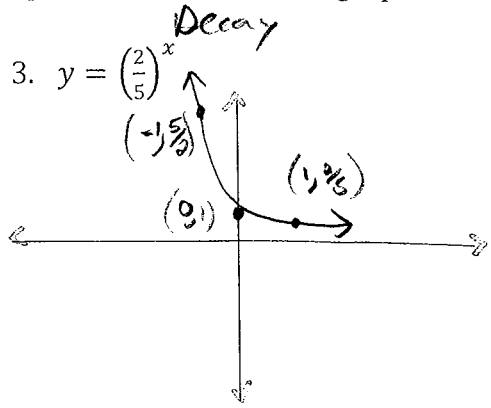
1 $y = 6^x$ Growth



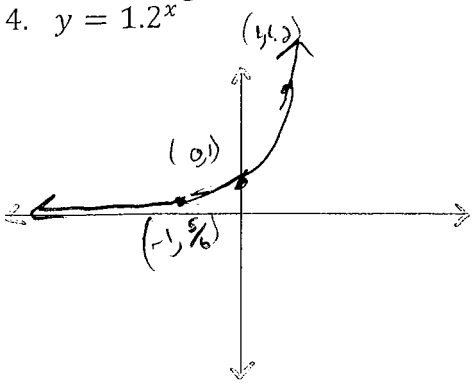
2. $y = \left(\frac{4}{3}\right)^x$ Growth



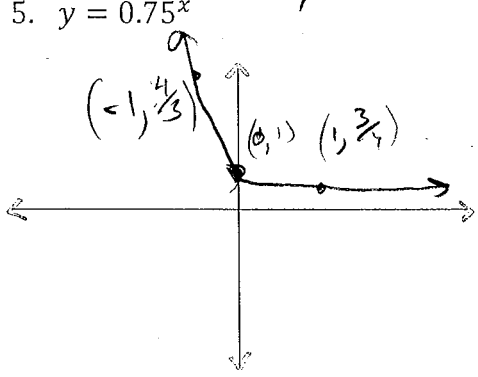
3. $y = \left(\frac{2}{5}\right)^x$ Decay



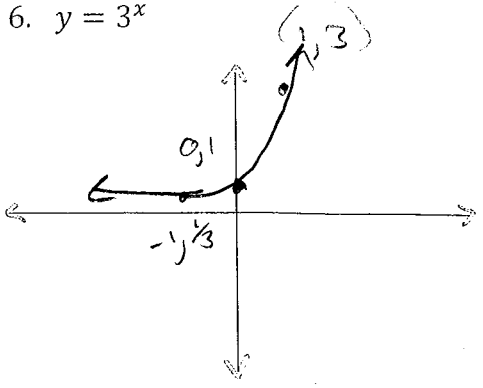
4. $y = 1.2^x$ Growth



5. $y = 0.75^x$ Decay



6. $y = 3^x$



7. A) Determine whether each table represents a linear, quadratic, or exponential function. **Justify your reasoning!**

A.

x	0	3	6	9	12	15
y	0.25	1	4	16	64	256

+3 +3 +3

×4 ×4 ×4

multiply by 4

exponential

B.

x	−4	−3	−2	−1	0	1	2
y	16	8	4	2	1	$\frac{1}{2}$	$\frac{1}{4}$

+1

×1/2 ×1/2 ×1/2

multiply by 1/2

exponential

C.

x	5	10	15	20	25	30
y	4	3	7	16	30	49

+5 +5

−1 +4 +9 +14

5 5 5

Quadratic 2nd difference

D.

x	−3	1	5	9	13
y	8	−3	−14	−25	−36

+4 +4 +4

−11 −11 −11

linear first difference

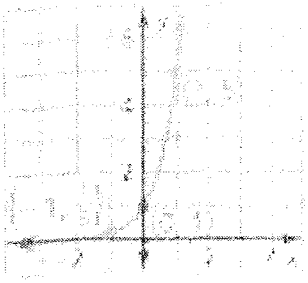
B) For the tables in Part A, if it represents a linear function, determine the rate of change. If the table represents an exponential function, tell whether it is growth or decay and determine the growth factor.

7A) Growth 4/3

7B) Decay 1/2/1 = 1/2

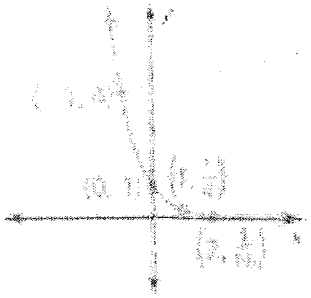
7d) $\frac{-11}{4}$

8. Use the graph of $f(x) = b^x$ to identify the value of the base b.



$b = 5$

9. Consider the graph of an exponential function of the form $f(x) = b^x$.
   a. Determine whether the graph of f represents exponential growth or exponential decay. Justify your reasoning.



exponential decay, as x gets bigger the y values approach zero.

   b. Determine the value of the base b.

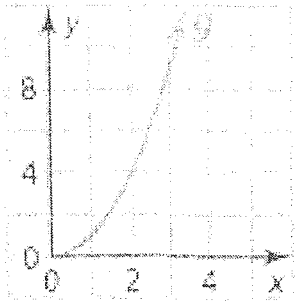
$b = 1/4$

   c. What are the domain and range of the function?

Domain: $(-\infty, \infty)$ Asymptote: $y = 0$

Range: $(0, \infty)$

10. Your friend says the graph of $f(x) = 2^x$ increases at a faster rate than the graph of $g(x) = x^2$ when $x \geq 0$ (shown at the right). Is your friend correct? Explain your reasoning.



x	x^2
0	0
1	1
2	4
3	9
4	16
5	25

x	2^x
0	1
1	2
2	4
3	8
4	16
5	32