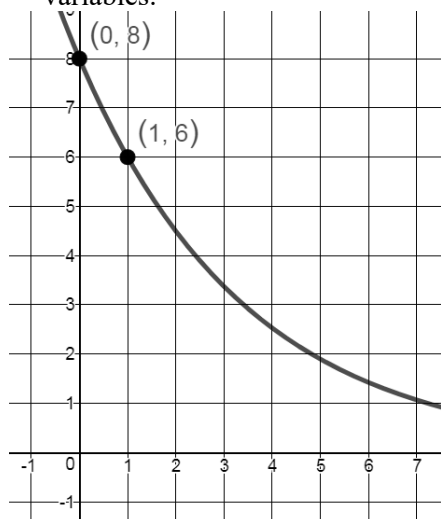# 7.3 Linear vs. Exponential

Name: _____

Identify the type of relationship and create a function from the given information.

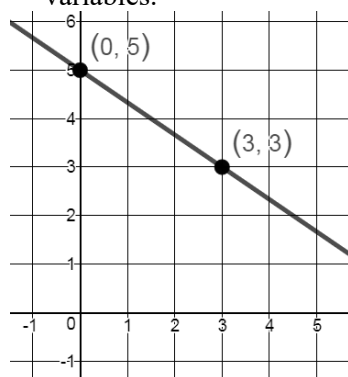1. The math club has $300 in their account a, and raise $40 every week w.

2. A $900 sound system decreases in value v by 9% each year t.

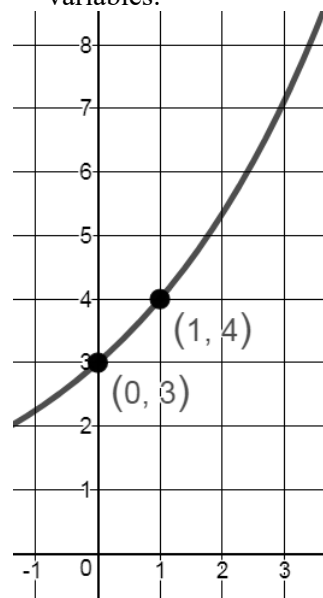3. There are 52 mosquitos m by the pool. Every hour h they increase by 20%.

4. Use x and $f(x)$ for your variables.

(0, 8)
(1, 6)

5. Use x and $f(x)$ for your variables.

(0, 5)
(3, 3)

6. Use x and $f(x)$ for your variables.

(1, 4)
(0, 3)

7.

t	0	1	2	3
$b(t)$	5	10.5	22.05	46.305

8.

n	0	1	2	3
$s(n)$	21	25.5	30	34.5

9.

x	0	1	2	3
$h(x)$	60	15	3.75	0.9375

Create a model (equation) for each scenario. Use function notation to answer the question.	
10. Pesticide is killing off the local mosquito population p such that the half-life of the population is 7 hours h. If there are 50,000 mosquitos, how may will there be left in 2 days?	11. A stock portfolio has a value v of $651,000 and doubles every 15 years t. How much will the portfolio be worth in 22 years?
12. A population p of 28,000 people doubles every 21 years t. How many people will there be in 60 years?	13. There is 820 grams of radioactive material r. The half-life of the material is 450 years t. How much radioactive material will there be in 3,000 years?

Answers to 7.3 CA #2

1. Linear Growth $a(w) = 300 + 40w$	2. Exponential Decay $v(t) = 900(.91)^t$	3. Exponential Growth $b(h) = 52(1.2)^h$	4. Exponential Decay $f(x) = 8\left(\frac{3}{4}\right)^x$
5. Linear Decay $f(x) = 5 - \frac{2}{3}x$	6. Exponential Growth $f(x) = 3\left(\frac{4}{3}\right)^x$	7. Exponential Growth $b(t) = 5(2.1)^t$ 8. Linear Growth $s(n) = 21 + 4.5x$	9. Exponential Decay $h(x) = 60(0.25)^x$
10. $p(h) = 50{,}000(2)^{\frac{t}{7}}$ $p(48) = 431$ mosquitos	11. $v(t) = 651{,}000(2)^{\frac{t}{15}}$ $v(22) = \$1{,}799{,}250.57$	12. $p(t) = 28{,}000(2)^{\frac{t}{21}}$ $p(60) = 202{,}882$ people	13. $r(t) = 820\left(\frac{1}{2}\right)^{\frac{t}{450}}$ $r(3{,}000) = 8.07$ grams