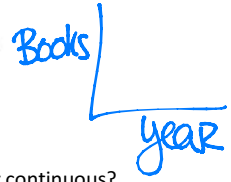


1. Decide whether the word problem represents a linear or exponential function. Circle either linear or exponential. Then, write the function formula.

a. "A library has 8000 books, and is adding 500 more books each year."



Linear or exponential? $y = 8000 + 500x$

What is the domain? How many books would you have after 6 years?

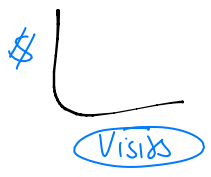
Discrete or continuous?

years $[0, 1, 2, 3... \infty)$

$8000 + 500(6)$
 $11,000$ books

b. "A gym's customers must pay \$50 for a membership, plus \$3 for each time they use the gym."

Linear or exponential? $y = 50 + 3x$



What is the domain? How much are you paying after 50 visits?

Discrete or continuous?

Visits # $[0, 1, 2... \infty)$

$50 + 3(50)$
\$200

c. "A bank account starts with \$10. Every month, the amount of money in the account is tripled."

Linear or exponential? $y = 10(3)^x$



What is the domain? How much money will you have after 24 months?

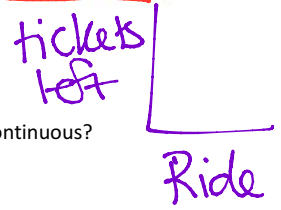
Discrete or continuous?

Months $[0, \infty)$

24 months $10(3)^{24} = 2.824 \times 10^{12}$

d. "At the start of a carnival, you have 50 ride tickets. Each time you ride the roller coaster, you have to pay 6 tickets."

Linear or exponential? $y = 50 - 6x$



What is the domain? How many tickets would you have left after 10 rides?

Discrete or continuous?

Rides $[0, 1, 2... \infty)$

$50 - 6(10)$
-10
Can't take 10 rides

How many rides until you run out of tickets?

$50 - 6(9) = -4$
 $50 - 6(8) = 2$ tickets left over

e. "There are 20,000 owls in the wild. Every decade, the number of owls is halved."

10 yrs

Linear or exponential? $y = 20000 \left(\frac{1}{2}\right)^x$

owls

What is the domain? How many owls would be left after 50 years? Discrete or continuous?

Decades
[0, ∞)

$20000 \left(\frac{1}{2}\right)^5 = 625$
Owls

Decades

* How long until the owls are almost extinct?

3. The table below shows the amount of money Sam will earn (y) by shoveling (x) number of driveways.

Number of Driveways, X	3	4	5	6	7	9
Earnings in Dollars, Y	21	35	49	63		87

Handwritten notes: +2, +2, +2 (between x values); +14, +14, +14 (between y values)

$\frac{\Delta y}{\Delta x} = \frac{14}{2} = 7$
d = 7

What would be the equation for this scenario? Discrete or continuous? Exponential or linear?

$a_n = 7 + 7(n-1)$
 $A_n = 7n$

Discrete
1 driveway at a time

What would be the domain for this situation?



D: # driveways
[0, 1, 2, ..., ∞)

x	y
0	0
1	7
2	14
3	21

Create the equation for each table.

x	0	1	2	3	4	5	6	7
y	10	5	2.5	1.25	.625	.3125	.15625	.078125

$r = \frac{a_2}{a_1} = \frac{2.5}{5} = 0.5$

Linear or exponential? $y = 10(0.5)^x$ or $y = 10(0.5)^{x-1}$

x	0	1	2	3	4	5	6	7
y	12	8	4	0	-4	-8	-12	-16

Linear or exponential? $y = -4x + 12$