Today:

Sequences Tasks (pick up worksheet)

Tomorrow is FRIDAY

THE MOMENT YOU REALIZE IT'S ALMOST SPRING BREAK
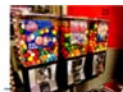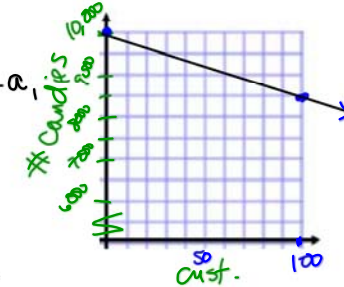
Algebra 2 Sequences Tasks

Name: _____

Date: _____ Per: _____

The Food-Mart grocery store has a candy machine like one pictured here. Each time someone inserts a quarter, 15 candies come out of the machine. The machine initially holds 10,000 individual candies.

Part 1 - Model the data using the table and graph below.

# of Customers	# of Candies
0	10,000
1	9,985 ← a_1
2	9,970
3	
4	
5	
6	
7	9,895

Candies (10,000 ... 900, 800, 700, 600)

cust. (50, 100)

Part 2 - Answer the questions below.

a) Is this sequence ⟨arithmetic⟩ or geometric? Explain. minus 15 for next term

b) State the common ⟨difference⟩ or common ratio $d = -15$

c) Write the explicit rule that models the sequence described.

$$a_n = 9985 + (n-1)(-15)$$

d) What is the number of candies remaining after 30 customers? Use the rule from part (c).

$$a_{30} = 9985 + (30-1)(-15) = 9,550$$

e) **Extension:** To avoid theft, the manager of the store takes all the money out when there is $25 in the machine. How many candies are in the machine after $25 has accumulated?

.25 $\frac{25}{.25}$ 100 customers

$$a_{100} = 9985 + (100-1)(-15) = 8500$$

Justin Bieber is a massive diva and requires his concert tickets to be SUPER EXPENSIVE and at least at a price of $100. His current concert ticket prices are at $50 per ticket. His management staff and the venue staff decide to compromise and increase his ticket prices by 10% for every concert he plays.

10% $r = 1.1$

Use the table to the right to display the prices of Bieber's concert tickets. If necessary, round to the nearest penny. **Hint:** To find the next term, you want the original 100% plus the additional 10%.

a) Is this sequence arithmetic or geometric? Explain.

multiply to get next term

b) State the common difference or common ratio. 1.1

c) Write the explicit rule that models the sequence described.

$a_n = 50(1.1)^{(n-1)}$

# of Concerts	Ticket Price
1	50
2	55
3	60.50
4	66.55
5	73.21
6	80.53
7	88.58

d) How much will the ticket price be for Bieber's 10th concert? Use the formula from part (c).

$a_{10} = 50(1.1)^{(10-1)} = \$117.90$

e) How much will the ticket price be for Bieber's 15th concert? Use the formula from part (c).

$a_{15} = 50(1.1)^{(15-1)} = \$189.87$

f) **Extension:** After how many concerts will Bieber's tickets *FINALLY* be worth his demanded $100 each? (Set up, and solve an equation)

$$\frac{100}{50} = \frac{50(1.1)^{(n-1)}}{50}$$

$$2 = (1.1)^{(n-1)}$$

$$\log_{1.1} 2 = n - 1$$

$$\frac{\log 2}{\log 1.1} = n - 1$$

$$7.27 = n - 1$$
$$\underline{+1 \qquad +1}$$
$$8.27 = n$$

Complete any missing homework assignments