Math 1

2-2 Practice Part 4

Name KEY

1. You visit Wheaton Metro Station in Maryland and ride their escalator which is 115 feet tall and lowers the riders 0.697 ft/sec. After 1 second your height would be 114.303 ft, after two seconds your height is 113.606 ft and after 3 seconds the height would be 112.909 ft.

   a. List your height for the next 4 seconds

   114.303, 113.606, 112.909, 112.212, 111.515, 110.818, 110.121, ...

   b. Write a recursive equation to represent your height while riding the escalator.

$$\begin{cases} a_0 = 115 \\ a_n = a_{n-1} - 0.697 \end{cases} \quad \text{or} \quad \begin{cases} a_1 = 114.303 \\ a_n = a_{n-1} - 0.697 \end{cases}$$

   c. Write an explicit equation to represent your height while riding the escalator.

$a_n = 115 - 0.697n$ or $a_n = 114.303 + (n-1)(-0.697)$

   d. Explain what you would be finding if you found a_{120}.

You would be finding your height on the escalator after 120 seconds (2 mins).

   e. Find a_{120}.

$a_{120} = 31.36$

   f. Since the total height traveled is 115 feet, how many seconds would it take to reach the bottom of the escalator?

$0 = 115 - 0.697n$ or $0 = 114.303 + (n-1)(-0.697)$

$-115 = -0.697n$

$164.993 = n$

2. Julia works at a kiosk in the mall that sells sunglasses. She gets paid $20.00 just to show up and work, but then makes a commission of $5 on each pair of glasses she sells.

a. What would a_1 represent in this situation?

How much she gets paid if she sells 1 pair of sunglasses.

b. What term would $20 be in the sequence?

a_0 because she will be paid $20 if she sells 0 sunglasses

c. List the first four terms of Julia's pay for a day.

20, 25, 30, 35

d. Write an explicit formula that models Julia's pay.

$a_n = 20 + 5n$ or $a_n = 25 + (n-1)(5)$

e. Write a recursive formula that models Julia's pay.

$$\begin{cases} a_0 = 20 \\ a_n = a_{n-1} + 5 \end{cases} \quad \text{or} \quad \begin{cases} a_1 = 25 \\ a_n = a_{n-1} + 5 \end{cases}$$

f. Which formula would be best to use to answer the following question: How much money will Julia get paid if she works and sells 15 sunglasses? Solve it.

Explicit.

$20 + 5(15) = \$95$

g. How many sunglasses did Julia sell if she got paid $275?

$275 = 20 + 5n$

$255 = 5n$

$51 = n$