

# Warmup

Write the Recursive & Explicit

1)

x	y
1	48
2	40
3	32
4	24
5	16

$$\frac{16-40}{5-2} = -8$$

$$d = -8$$

2) Every time that Mrs. Forrester sees 7th period, she gains 13 gray hairs. She starts with 16 on day 1.

How many gray hairs does she have at day 46?

Rec

$$A_1 = 16$$

$$A_n = A_{n-1} + 13$$

Exp

$$A_n = 16 + 13(n-1)$$

$$16 + 13n - 13$$

$$A_n = 3 + 13n$$

$$A_1 = 48 \quad d = -8$$

Exp  $A_n = 48 - 8(n-1)$

$$3 + 13(46)$$

601 gray hairs

$$48 - 8n + 8$$

$$A_n = 56 - 8n$$

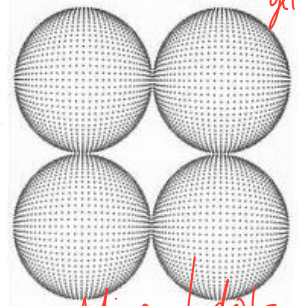
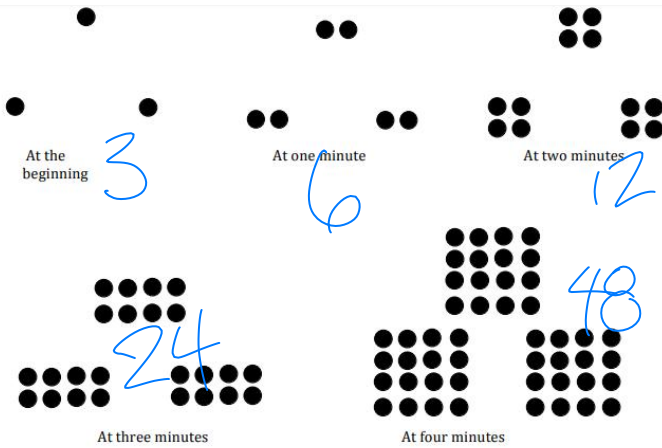
~~function notation~~

$$f(n) = 56 - 8n$$

Rec  $A_1 = 48 \quad A_n = A_{n-1} - 8$

Growing, Growing Dots

A Develop Understanding Task



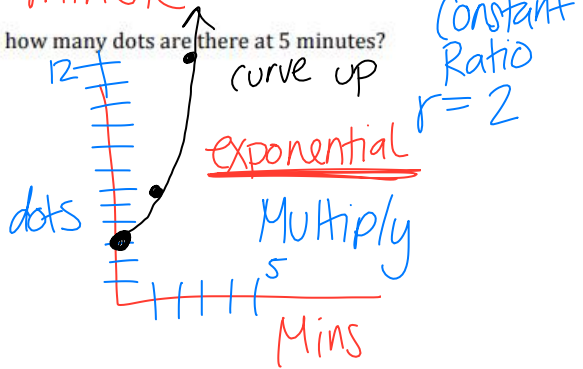
Mins	dots
0	3 > x2
1	6 > x2
2	12 > x2
3	24 > x2
4	48

1. Describe and label the pattern of change you see in the above sequence of figures.

x2 (doubling) every minute

2. Assuming the sequence continues in the same way, how many dots are there at 5 minutes?

96 dots = 48 x 2



3. Write a recursive formula to describe how many dots there will be after t minutes.

$A_n = r(A_{n-1})$   $A_1 = \#$   $A_1 = 6$   $r = 2$   
 $A_n = 2(A_{n-1})$

4. Write an explicit formula to describe how many dots there will be after t minutes.

$A_n = a_1(r)^{n-1}$  → up in air → exponent  
 $A_n = 6(2)^{n-1}$

$A_3 = 24$   
 $r = 2$

$24(2)^{n-3}$

$96(2)^{n-5}$

dots are @ 26 mins

# Rec & Exp

1)  $\frac{1}{3}, 1, 3, 9, 27$

Exp  
 $A_n = \frac{1}{3} (3)^{n-1}$

Rec  
 $A_1 = \frac{1}{3}$   
 $A_n = 3(A_{n-1})$

2)

Exp  
 $A_n = 80 \left(\frac{1}{2}\right)^{n-1}$

Rec  
 $A_1 = 80$   
 $A_n = \frac{1}{2}(A_{n-1})$

x	y
1	80
2	40
3	20
4	10
5	5

$\frac{40}{80} = \frac{1}{2}$   
 OR  
 0.5

3)

x	0	1	2	3	4	5
y	100	-50	+25	-12.5	6.25	-3.125

$A_n = 50 \left(-\frac{1}{2}\right)^{n-1}$

$A_1 = -50$

$A_n = -\frac{1}{2}(A_{n-1})$

1) Make 4 different ~~exp~~ equations

x	0	1	2	3	4
y	100	80	64	51.2	40.96