

Warmup

1) Create the Recursive & Explicit

a) $-12, -7, -2, \dots$
 $+5$ $+5 = d$

$A_1 = -12$ Exp
 $A_n = -12 + 5(n-1)$
 $-12 + 5n - 5$

Rec
 $A_1 = -12$
 $A_n = A_{n-1} + 5$

$A_n = -17 + 5n$

b)

x	y
1	30,000
2	40,000 $\leftarrow -10,000$
5	70,000

$A_1 = 30,000$ $70,000 - 40,000$
 $d = 10,000$ $\frac{5 - 2}{+10,000 = d}$

Rec
 $A_1 = 30,000$
 $A_n = A_{n-1} + 10,000$

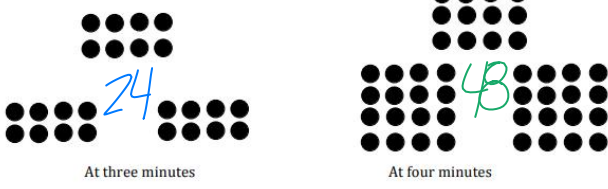
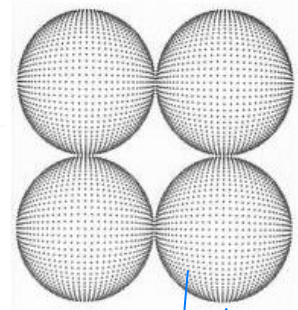
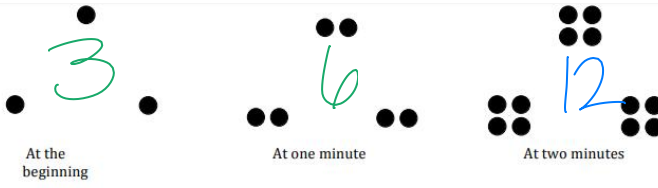
Exp
 $A_n = 30,000 + 10,000(n-1)$
 $30,000 + 10,000n - 10,000$

$A_n = 20,000 + 10,000n$

Growing, Growing Dots

A Develop Understanding Task

Multiply



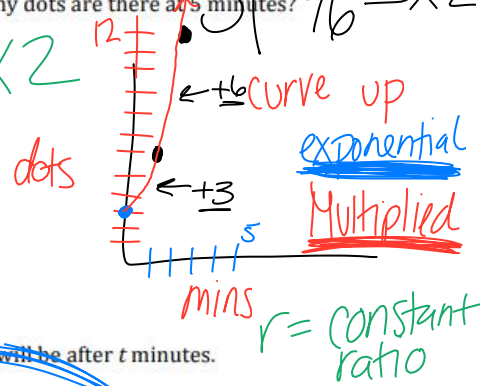
mins	dots
0	3
1	6 $\rightarrow \times 2$
2	12 $\rightarrow \times 2$
3	24 $\rightarrow \times 2$
4	48 $\rightarrow \times 2$
5	96 $\rightarrow \times 2$

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

doubling ($\times 2$) every min

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

96 dots 48×2



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

$r=2$
 $a_n = r(a_{n-1})$
 $a_1 = \#$
 $A_1 = 6$
 $A_n = 2(a_{n-1})$

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

$A_n = A_1(r)^{n-1}$
 $A_n = 6(2)^{n-1}$

exponent
 up in air (Not next to)
 how many dots @ 30 mins
 $6(2)^{30-1} = 3,221,225,472$
 dots

Exp & Rec

1) 10, 20, 40, 80...

$$\frac{\text{2nd term}}{\text{1st term}} = \frac{20}{10} = \boxed{2=r}$$

Rec
 $A_1 = 10$ $A_n = 2(A_{n-1})$

Exp
 $A_1 = 10$ $A_n = 10(2)^{n-1}$

2)

X	Y
0	$\frac{1}{3}$
1	1
2	3
3	9
4	27

$\times 3$ $\frac{1}{3}$
 $\times 3$
 $\times 3$
 $\times 3$
 $\times 3$
 $r=3$

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

Exp: $A_1 = 1$
 $A_n = 1(3)^{n-1}$

3)

X	Y
1	40
2	20
3	10
4	5

$$\frac{20}{40} = \frac{1}{2} \text{ OR } 0.5$$

r $A_1 = 40$

Exp
 $A_n = 40\left(\frac{1}{2}\right)^{n-1}$

Rec
 $A_1 = 40$ $A_n = \frac{1}{2}(A_{n-1})$

Quiz

1) 4, 12, 36...

Exp & Rec

2) 90, 30, 10, $\frac{10}{3}$...

Exp & Rec