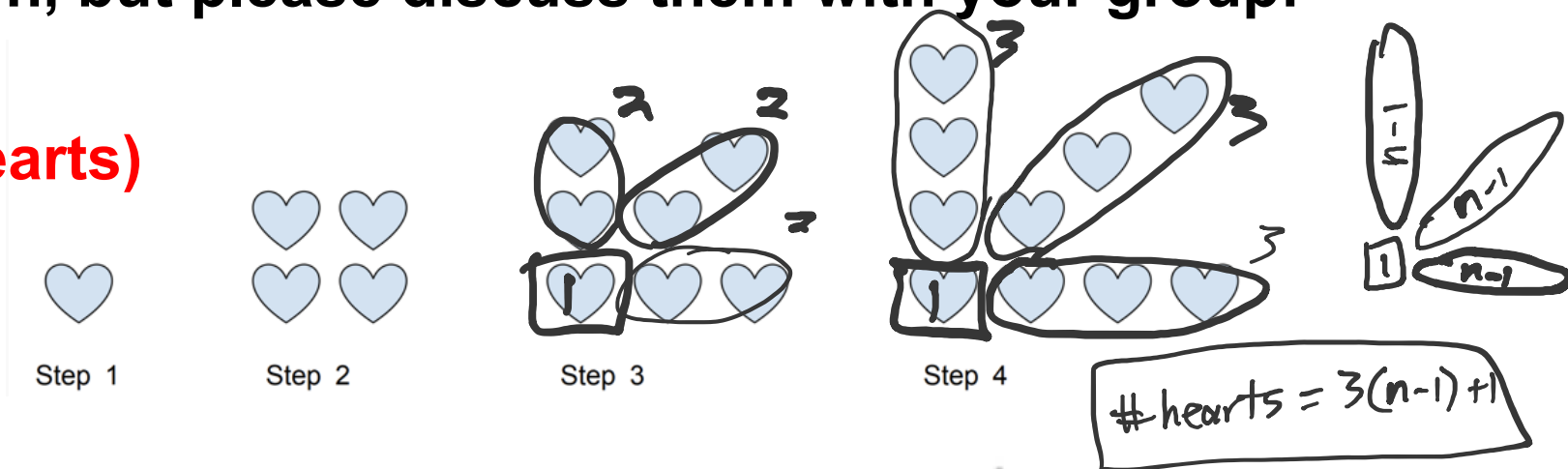


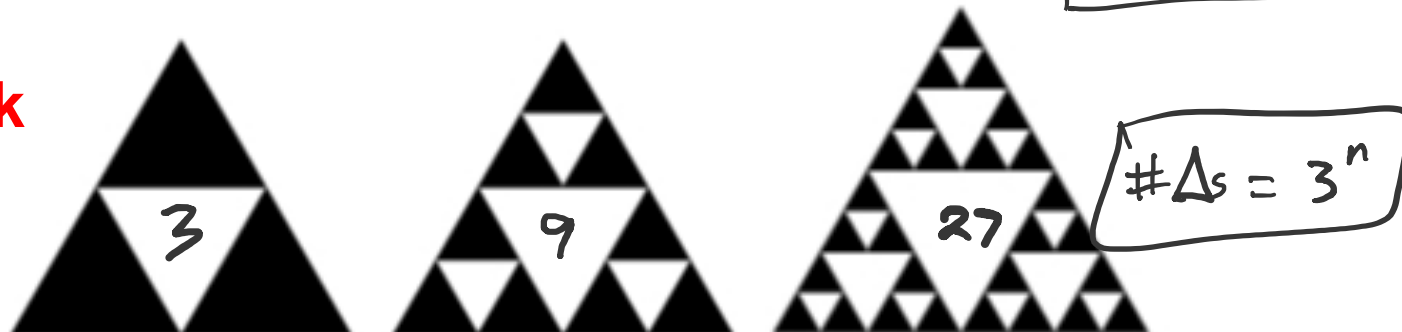
Warmup 11/ (# of sides on a hexagon)

- For each pattern, find an equation to give the number of units in step n . You do not need to write them down, but please discuss them with your group!

(# of hearts)



(# of black triangles)



Go over Homework

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OBJECTIVE

Identify the differences between
Linear and Exponential Functions

OPENER

1) Find an Equation to Describe the Data in the Table

x	f(x)
0	10
1	15
2	20
3	25
4	30

$$f(x) = 5x + 10$$

2) Find an Equation to Describe the Data in the Table

$$f(x) = 1.6^x$$

x	f(x)
0	1
1	6
2	36
3	216
4	1296

$$1 = 1.6^0$$

$$1.6 = 1.6^1$$

$$1.6 \cdot 6 = 1.6^2$$

$$1.6 \cdot 6 \cdot 6 = 1.6^3$$

$$1.6 \cdot 6 \cdot 6 \cdot 6 = 1.6^4$$

3) Find an Equation to Describe the Data in the Table

x	f(x)
-2	4
-1	6
0	8
1	10
2	12

$$f(x) = 2x + 8$$

4) Find an Equation to Describe the Data in the Table

x	f(x)
0	5
1	10
2	20
3	40
4	80

$$f(x) = 5 \cdot 2^x$$

5) Find an Equation to Describe the Data in the Table

x	f(x)
0	10
1	30
2	90
3	270
4	810

$$f(x) = 10 \cdot 3^x$$

Linear vs Exponential Functions

- Linear Functions have a constant rate of change.
- Exponential Functions show growth or decay by equal factors over equal intervals

Exponential Functions have the form $f(x) = ab^x$ where $a \neq 0$, $b \neq 1$, and $b > 0$

a is the “initial value” or the y-intercept

b is the growth or decay rate

1. Linear or Exponential?
2. Find an Equation to Describe the Data in the Table

x	f(x)
-2	-20
-1	-10
0	0
1	10
2	20

Linear

$$f(x) = 10x$$

1. Linear or Exponential?
2. Find an Equation to Describe the Data in the Table

x	f(x)
-2	1/100
-1	1/10
0	1
1	10
2	100

Exponential

$$f(x) = 1 \cdot 10^x$$

1. Linear or Exponential?
2. Find an Equation to Describe the Data in the Table

x	f(x)
-2	6/25
-1	6/5
0	6
1	30
2	150

Exponential

$$f(x) = 6 \cdot 5^x$$

1. Linear or Exponential?
2. Find an Equation to Describe the Data in the Table

x	f(x)
-2	18
-1	21
0	24
1	27
2	30

Linear

$$f(x) = 3x + 24$$

1. Linear or Exponential?
2. Find an Equation to Describe the Data in the Table

x	f(x)
-1	8
0	4
1	2
2	1
3	1/2

Exponential

$$f(x) = 4 \cdot \left(\frac{1}{2}\right)^x$$

1. Linear or Exponential?
2. Find an Equation to Describe the Data in the Table

x	f(x)
0	5
2	7
4	9
6	11
8	13

Linear

$$\frac{2}{2} = 1$$

$$f(x) = 1x + 5$$

$$f(x) = x + 5$$

1. Linear or Exponential?
2. Find an Equation to Describe the Data in the Table

x	f(x)
-2	7/16
-1	7/4
0	7
1	28
2	112

Exponential

$$f(x) = 7 \cdot 4^x$$

1. Linear or Exponential?
2. Find an Equation to Describe the Data in the Table

x	f(x)
0	99
1	33
2	11
3	11/3
4	11/9

Exponential

$$f(x) = 99 \cdot \left(\frac{1}{3}\right)^x$$

Homework

- **Worksheet**