

Name: Example Date: \_\_\_\_\_ Period: \_\_\_\_\_

**Modular Arithmetic**  
Addition

Complete each table. create and follow the pattern for each  
 Mod 4 - #4 does not exist Mod 5

- 0=0
- 1=1
- 2=2
- 3=3
- 4=0
- 5=1
- 6=2
- 7=3
- 8=0
- 9=1

+4	0	1	2	3
0	0	1	2	3
1	1	2	3	0
2	2	3	0	1
3	3	0	1	2

+5	0	1	2	3	4
0					
1					
2					
3					
4					

Mod 6

+6	0	1	2	3	4	5
0						
1						
2						
3						
4						
5						

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### Modular Multiplication

Complete each table.

Mod 4

$x^4$	0	1	2	3
0				
1				
2				
3				

$0=0$   
 $1=1$   
 $2=2$   
 $3=3$   
 $4=4$   
 $5=0$   
 $6=1$   
 $7=2$   
 $8=3$   
 $9=4$   
 $10=0$   
 $11=1$   
 $12=2$   
 $13=3$   
 $14=4$   
 $15=0$   
 $16=1$

Mod 5 # 5 does not exist  
 Create and follow the pattern

$x^5$	0	1	2	3	4
0	0	0	0	0	0
1	0	1	2	3	4
2	0	2	4	1	3
3	0	3	1	4	2
4	0	4	3	2	1

Mod 6

$x^6$	0	1	2	3	4	5
0						
1						
2						
3						
4						
5						

MATH/ART PATTERN #1

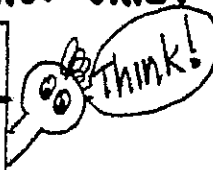
Name Example

Date \_\_\_\_\_

MATH/ART PATTERN #1

Mod 5 ← 5 does not exist

X <sup>5</sup>	0	1	2	3	4
0	0	0	0	0	0
1	0	1	2	3	4
2	0	2	4	1	3
3	0	3	1	4	2
4	0	4	3	2	1



Fill in the grid for multiplication modulo 5. Then assign a design to each number. Fill in the cells below with the correct design for each number. Use bright colors to color the key, then color the cells to match the key.

- 0 = 0
- 1 = 1
- 2 = 2
- 3 = 3
- 4 = 4
- 5 = 0
- 6 = 1
- 7 = 2
- 8 = 3
- 9 = 4
- 10 = 0
- 11 = 1
- 12 = 2
- 13 = 3
- 14 = 4
- 15 = 0
- 16 = 1

0 = 1 = 2 = 3 = 4 =

Choose pattern colors


This design goes into each quadrant on a graph (see back)

pattern as drawn	pattern reflected (folded over)
reflect down (folded down)	

only slanted lines will change

# Mod 5 math Art Pattern #1

#1  
pattern #1

#2  
pattern #1  
reflected  
(folded over)

#3  
pattern #1  
reflected  
down  
(folded down)

#4 either  
pattern #2  
reflected down  
or  
pattern #3  
folded (reflected)  
over.

