

23. Make up a pattern that begins with these two numbers:

**3, 6**

- a. Write the first 8 numbers in the pattern.
- b. Write a rule for the pattern you wrote in part a.
- c. Make up a DIFFERENT pattern that begins with the same two numbers, **3** and **6**. Write the first 8 numbers of this pattern.
- d. Write the rule for the pattern you made in part c.

#### CONSTRUCTED-RESPONSE SCORING GUIDE

<b>Score</b>	<b>Description</b>
4	Student demonstrates a thorough understanding of patterns by extending a pattern in different ways and stating the rule for the extended patterns.
3	Student demonstrates a general understanding of patterns by extending a pattern in different ways and stating the rule for the extended patterns with only a minor error or omission.
2	Student demonstrates a basic understanding of patterns by correctly completing a significant portion of the required tasks.
1	Student demonstrates a minimal understanding of patterns.
0	Response is incorrect or contains some correct work that is irrelevant to the skill or concept being measured.
Blank	No response.

## Training Notes for Constructed-Response #23

Score	Description
4	Total points: 6
3	Total points: 5
2	Total points: 3 or 4
1	Total points: 2 or 1 OR Student shows minimal understanding of patterns.

**Part a:** 2 points a sufficient number of terms to show pattern beginning with 3, 6  
OR 1 point work showing an attempt with a minor flaw

**Part b:** 1 point rule for pattern in Part a

**Part c:** 2 points a sufficient number of terms to show a different pattern beginning with 3, 6  
OR 1 point work showing an attempt with a minor flaw

**Part d:** 1 point for rule for pattern in Part c

**NOTES:** If student has fewer than 8 terms in either Part a, Part c, or both, deduct a total of 1 point. If student has a correct pattern that begins with digits other than 3 and 6, consider it a minor flaw.



23.

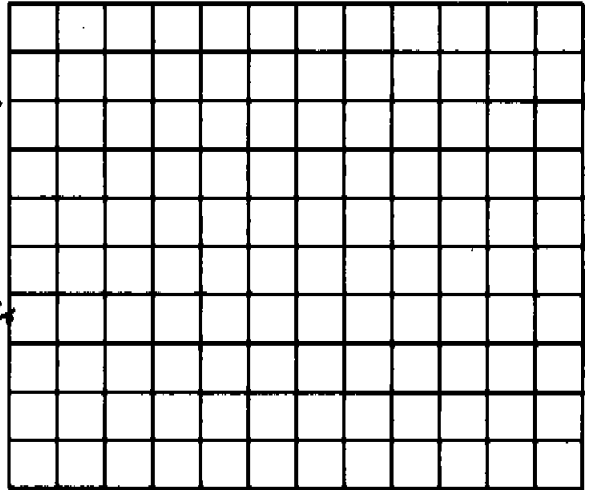
3

A. 3, 6, 9, 12, 15, 18, 21, 24.

B. add another 3 each time.

C. 3, 6, 10, 15, 21, 28, 36, 45.

D. start at 3, add another 3  
then keep adding one number.



23a.

3

The pattern is

3, 6, 9, 12, 15, 18, 21, 24.

b.

The rule is you have to add 3.

c.

The pattern is

3, 6, 12, 24, 48, 96, 192, 384.

d.

You have to multiply the number.

23.

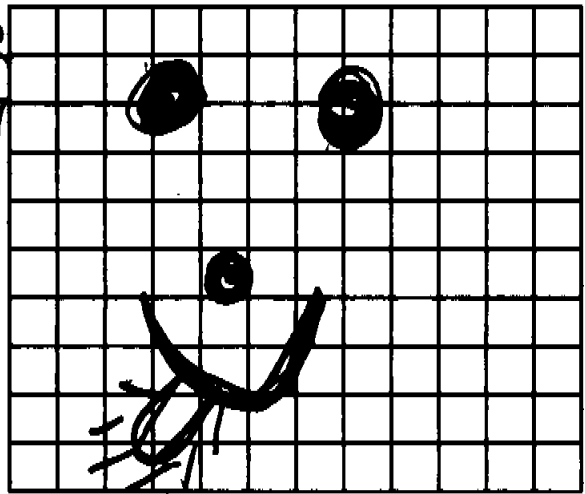
2

A. 3, 6, 9, 12, 15, 18, 21, 24, 27, 30

D skip 3 every time

C 3, 6, 8, 11, 13, 16, 20, 21

D skip as many as you need



23.

2

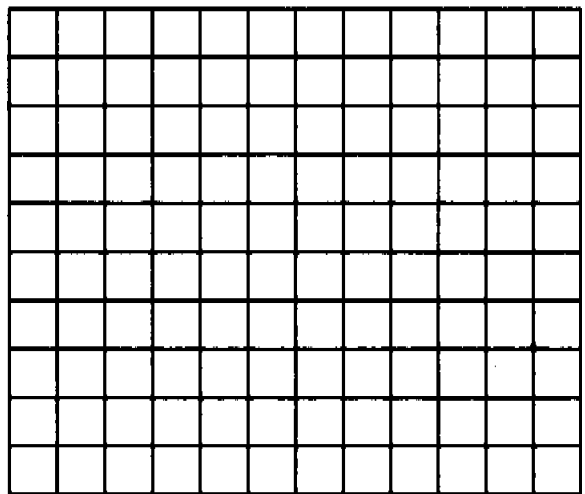
A. 3, 6, 9, 12, 15, 18, 21, 24

B I counted by three's

C. 3, 6, 8, 11, 12, 15, 16, 19

D. I counted by one's hands

3.

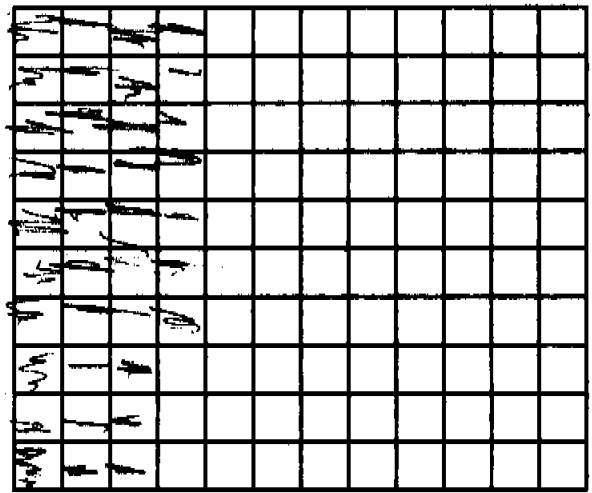


23.

1

① 3, 6, 5, 3, 6, 5, 3, 6  
 ② This is a pattern.  
 ③ 3, 6, 5, 3, 6, 5, 3, 6

I was just thinking about  
 patterns in my head and  
 they just pop out and I write them  
 down. That's all I have to say.

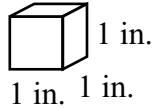


23.

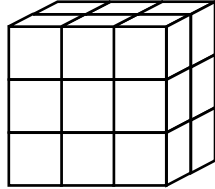
1

3	6	6	8	3	6	6	8	8	3	6
8	8	3	6	6	8	8	3	6	6	8
8	3	6	6	8	8	3	6	6	8	8
6	6	8	8	3	6	6	8	8	3	6
8	8	3	6	6	8	8	3	6	6	8
3	6	6	8	8	3	6	6	8	8	3
6	8	8	3	6	6	8	8	3	6	6
8	3	6	6	8	8	3	6	6	8	8
6	6	8	8	3	6	6	8	8	3	6
8	8	3	6	6	8	8	3	6	6	8

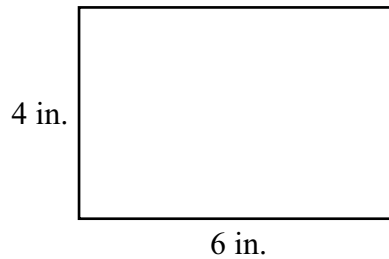
24. Mark has 100 1-inch cubes like the cube shown below.



- a. How many of his cubes did he have to use to make the stack of cubes shown below?

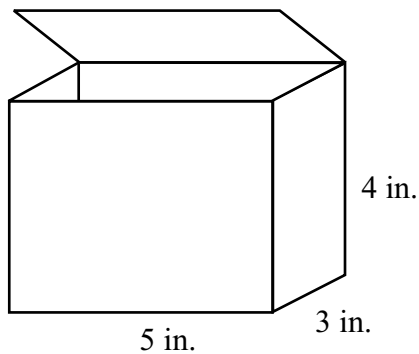


- b. Mark has a rectangular tray with a top 6 inches long and 4 inches wide, as shown below.



What is the greatest number of his cubes he can put on his tray if he does not put any of them on top of others? Use words, pictures, or numbers to explain how you know your answer is correct.

- c. What is the greatest number of the 1-inch cubes that Mark can fit into the box shown below at one time? Use words, pictures, or numbers to explain how you know your answer is correct.



## CONSTRUCTED-RESPONSE SCORING GUIDE

Score	Description
4	Student demonstrates a thorough understanding of the concepts of volume and area by correctly stating the number of cubes in a stack and correctly determining and explaining how many cubes will fit in a tray and box with given dimensions.
3	Student demonstrates a general understanding of the concept of volume and area by stating the number of cubes in a stack and determining and explaining how many cubes will fit in a tray and box with given dimensions with only a minor error or omission.
2	Student demonstrates a basic understanding of the concept of volume and area by correctly completing a significant portion of the required tasks.
1	Student demonstrates a minimal understanding of the concept of volume and area.
0	Response is incorrect or contains some correct work that is irrelevant to the skill or concept being measured.
Blank	No response.

### Training Notes for Constructed-Response #24

Score	Description
4	Total points: 5
3	Total points: 4
2	Total points: 2 or 3
1	Total points: 1

**Part a**      1 point      correct answer (18)

**Part b**      1 point      correct answer implicitly or explicitly stated (24)

**AND**        1 point      explanation showing correct strategy (e.g.,  $4 \times 6$ , a picture or verbal description of 4 rows of 6 each)

**Part c**      1 point      correct answer (60)

**AND**        1 point      explanation showing correct strategy

**NOTE:** In part c, do not penalize a student who takes the thickness of the box into account.

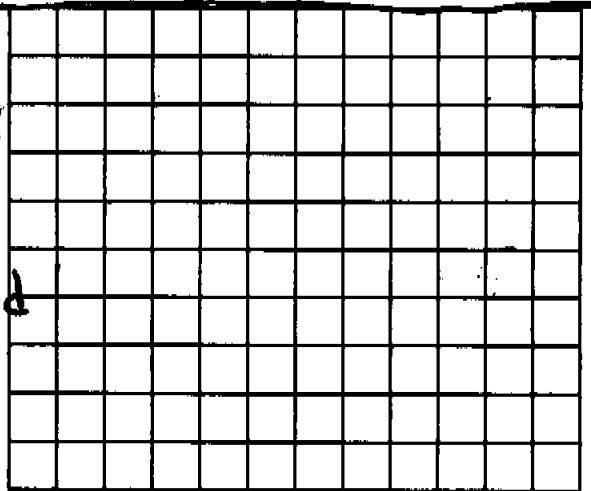
24.

(A) 18 Cubes were used

4

~~(B) I multiplid 4x6 and got 24. I did that because I did knew.~~

(C) I multiplid 4x3 and got 12, and then multiplid 12x5 an got 60. he can fit 60 Cubes in The box.



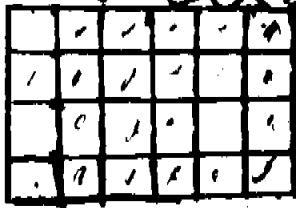
24.

(A) 18 cubes

4

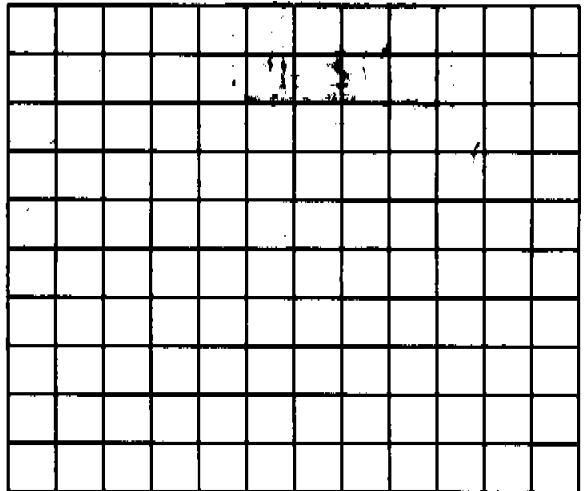
(B)

24 cubes



60 cubes

(C)  $4 \times 3 \times 5 = 60$

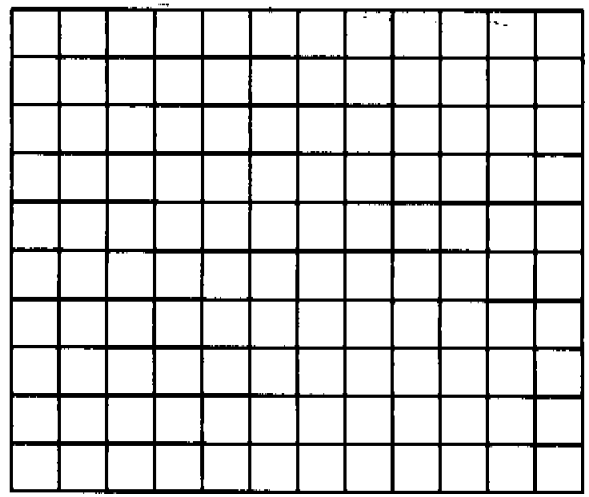




24.

2

AHe used 18  
6 24  
C 60



24.

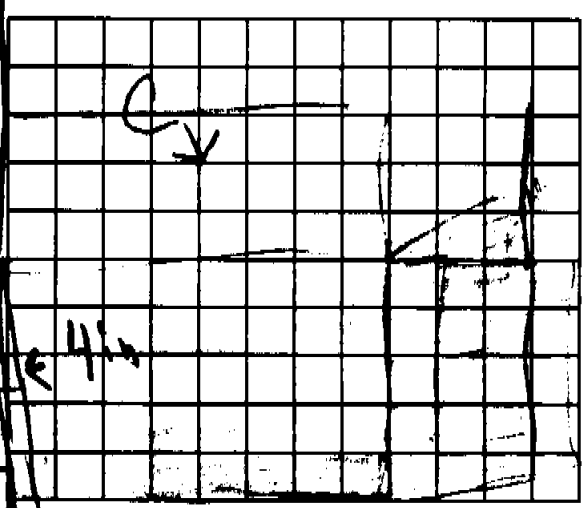
2

A. Mark used 18 cubes to build his square

B.v

25	17	13	9	5	1
22	18	14	10	6	2
23	19	15	11	7	3
24	20	16	12	8	4

Mark can use 24 squares



C.  
Mark can fit 24 cubes in his cube

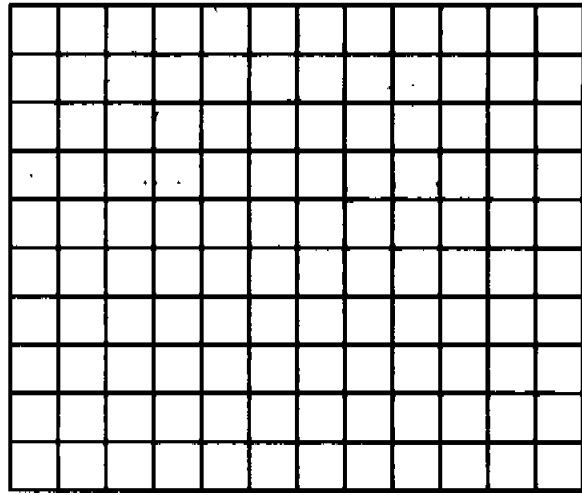
1	2	3	4	5	6	7	8
9	10	11	12	13	14	15	16
17	18	19	20	21	22	23	24

5 in x 4 in

24.

1

He used 18 cubes to make his block



24.

1

He had to use 18 of his cubes, could use 20 cubes. ↓

I would say about 30 cubes could fit in his box. I don't know if my answer is correct, but I just took a guess.

