

- 1** The table below shows a relationship between values of  $x$  and  $y$ .

$x$	1	2	3	4
$y$	3	10	29	66

Mark your answer here: 1. A B C D

Which of the following equations describes the relationship between  $x$  and  $y$  for the values in the table?

- A.  $y = 3x$
- B.  $y = 3x + 4$
- C.  $y = x^2 + 2$
- D.  $y = x^3 + 2$

- 2** Each week, Shanice deposits a total of \$50 into her checking account and does not withdraw any money. Her account does not earn interest. At the end of 3 weeks, the total amount of money in Shanice’s account was \$170.

Mark your answer here: 2. A B C D

Which of the following equations represents  $y$ , the total amount of money in Shanice’s account at the end of  $x$  weeks?

- A.  $y = 50x + 20$
- B.  $y = 20x + 50$
- C.  $y = 50x - 20$
- D.  $y = 20x - 50$



- 3** An auditorium has 30 rows of seats. The first row has 40 seats. The second row has 42 seats. The third row has 44 seats. Each successive row has two more seats than the row before it. How many seats are there in the 30th row?
- A. 70 seats
  - B. 74 seats
  - C. 98 seats
  - D. 100 seats

Mark your answer here: 3. (A)(B)(C)(D)

- 4** The first five terms in a quadratic sequence are shown below.

6, 9, 14, 21, 30, . . .

What is the next term in the sequence?

- A. 39
- B. 40
- C. 41
- D. 42

Mark your answer here: 4. (A)(B)(C)(D)



- 5** Each year Jody receives a gift of money from her aunt. The amount is always equal to Jody’s age that year, plus the amount of the gift she received the previous year, as shown in the table below.

Mark your answer here: 5. (A)(B)(C)(D)

**Jody’s Gift from Her Aunt**

<b>Jody’s Age (years)</b>	1	2	3	4
<b>Amount of Gift</b>	\$1	\$3	\$6	\$10

If the pattern continues, what amount will Jody receive from her aunt when Jody’s age is 8 years?

- A. \$36
- B. \$28
- C. \$21
- D. \$16

- 6** The first four terms in a sequence, and the rules that define them, are shown below.

Mark your answer here: 6. (A)(B)(C)(D)

$$a_1 = 4$$

$$a_2 = 2a_1 + 3$$

$$a_3 = 2a_2 + 3$$

$$a_4 = 2a_3 + 3$$

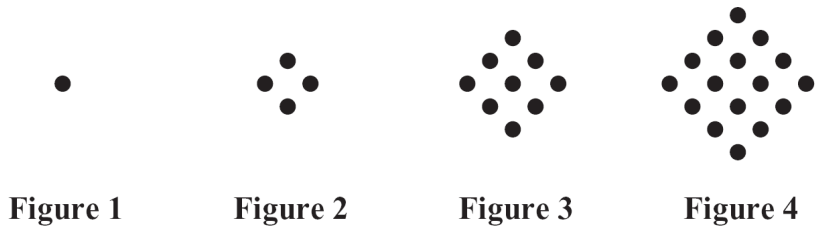
What is the value of  $a_4$ , the fourth term shown in the sequence above?

- A. 25
- B. 35
- C. 41
- D. 53



Directions: For the problem below, use a separate piece of paper to write your answers. Your teacher will not count anything you write on this page.

**7** The dots shown below represent the first four figures in a quadratic pattern.



The table below shows the number of dots needed for each of Figures 1 through 4.

Number of Dots per Figure								
Figure Number	1	2	3	4	5	6	7	8
Number of Dots	1	4	9	16				

- a. Copy the table into your Student Answer Booklet. Complete your table by writing the number of dots needed for each of Figures 5 through 8. Show or explain how you got each of your answers.
- b. Based on the pattern, what number of dots will be needed for Figure  $n$ ? Show or explain how you got your answer.
- c. What number of dots will be needed for Figure 20? Show or explain how you got your answer.
- d. If Figure  $n$  has **exactly** 225 dots, what is the value of  $n$ ? Explain your reasoning.

