Unit Test

Use the following information to answer the next question.

In divided by 2 = **Out**

1. Which of the following tables follows the given rule?

A.

In	10	24	76	92
Out	5	12	39	47

B.

In	18	28	52	98
Out	9	14	26	48

C.

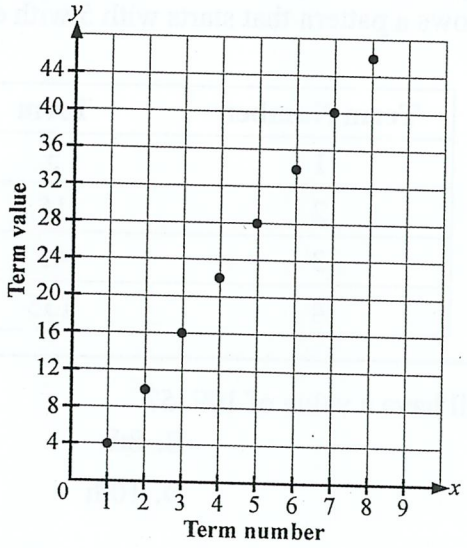
In	16	32	54	68
Out	8	16	27	35

D.

In	22	38	74	96
Out	11	19	37	48

Use the following information to answer the next question.

The given graph shows the term numbers and corresponding term values of a pattern that starts at 4 and continues by adding 6 to each term to get the next term.



2. According to the graph, the term number with a term value of 34 is

A. 4

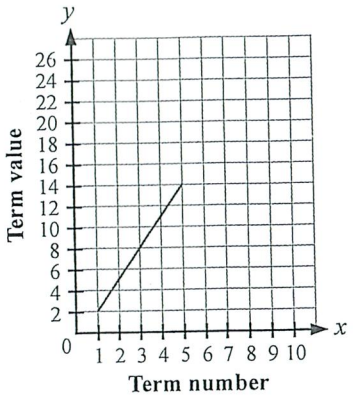
B. 5

C. 6

D. 7

Use the following information to answer the next question.

The given graph shows the corresponding term numbers and term values for a particular pattern.



3. If the pattern continues, which term number will have a term value of 23?

A. 8 **B.** 9

C. 10 **D.** 11

Use the following information to answer the next question.

This table of values shows a pattern that starts with 5 with each term increasing by a particular constant.

Term Number	Term
1	5
2	15
3	45
4	135

4. What term number will have a value of 10935?

A. 7th **B.** 8th

C. 9th **D.** 10th

Use the following information to answer the next question.

The given table lists the term numbers and values of a particular pattern.

Term number	1	2	3	4
Term value	5	9	13	17

5. If the pattern continues, which term number has a value of 29?

A. 6 **B.** 7

C. 8 **D.** 9

Use the following information to answer the next question.

A table of values is given.

Term Number	Term
1	3
2	6
3	12
4	?
5	?
6	?
7	?
8	?

6. The numeral 384 will be the

A. 8th term **B.** 7th term

C. 6th term **D.** 5th term

Use the following information to answer the next question.

The pattern rule is to start with 4 and multiply each term by 3 to get the next term.

Written Response

7. Using the given pattern rule, what term number will have a value of 972?

Use the following information to answer the next question.

$\boxed{7} \times \boxed{5} = \boxed{x} \times \boxed{7}$

8. For which value of x will the given equation be correct?

A. 5 **B.** 6 **C.** 7 **D.** 8

9. If Samantha is m years old now, which of the following expressions represents her age 8 years ago?

A. $m - 8$ **B.** $m \times 8$ **C.** $m + 8$ **D.** $m \div 8$

Use the following information to answer the next question.

A number pattern is given.
492, 495, 498, 501, 504, _____

10. If x is a number in the pattern, which of the following expressions can be used to find the next number?

A. $x + 3$ **B.** $x + 4$ **C.** $x \times 2$ **D.** $x - 3$

Use the following information to answer the next question.

Jaymeson uses a pattern rule to create this number pattern.
23, 25, 22, 24, 21

11. Which of the following expressions describes the pattern rule that Jaymeson used?

A. +3, –2

B. +2, –3

C. +1, –3

D. +2, –4

Use the following information to answer the next question.

Jen is thinking of a number. When she subtracts 10 from the number, the difference is 7. Mary wants to write an equation where the letter B represents the number Jen is thinking of.

12. Which of the following equations can Mary use to find out what number Jen is thinking of?

A. $B - 10 = 7$

B. $B - 7 = 10$

C. $B = 10 + 7$

D. $B + 7 = 10$

Use the following information to answer the next question.

The sum of two numbers is 13260. One of the numbers is 6204, and the other number is unknown.

13. Which of the following equations **cannot** be used to solve the given problem?

A. $13\,260 - 6\,204 = g$

B. $13\,260 - g = 6\,204$

C. $6\,204 + g = 13\,260$

D. $6\,204 + 13\,260 = g$

Use the following information to answer the next question.

Mikayla had 28 star stickers. She decided to give some of her stickers to her classmates. She chose a certain number of classmates and gave them each four stickers. Mikayla used this array to determine how many classmates received stickers.

14. If k represents the number of classmates who received four stickers, then which of the following equations represents the strategy that Mikayla used to figure out how many classmates received stickers?

A. $4 = k \div 28$

B. $28 = k \div 4$

C. $k = 28 \div 4$

D. $k = 4 \div 28$

Use the following information to answer the next question.

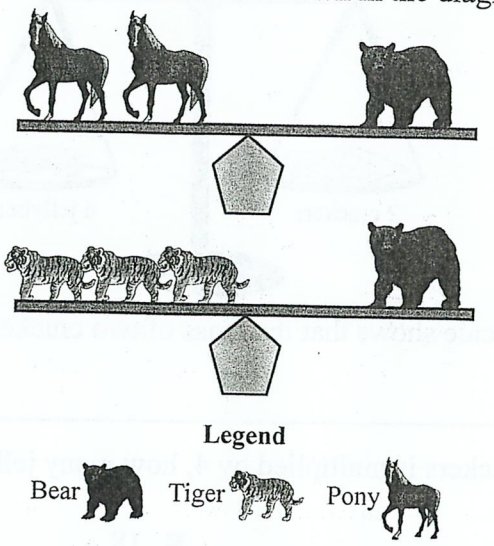
Lora has three piles of dimes. She knows that there are 3 dimes in one pile and 25 dimes all together. She also knows that there are the same number of dimes in each of the other two piles. Lora writes the equation $d + d + 3 = 25$ to represent the number of dimes in the three piles.

Numerical Response

15. In the equation, the letter d is equal to _____.

Use the following information to answer the next multipart question.

16. At the circus, animals balance on a seesaw as shown in the diagram.



a) Which of the following statements about the information in the diagram is **false**?

A. Two ponies are heavier than 3 tigers.

B. Seven ponies are heavier than 3 bears.

C. Three tigers weigh as much as 2 ponies.

D. One bear weighs as much as 2 ponies or 3 tigers.

b) If 2 ponies balance 1 bear and 3 tigers balance 1 bear, then how many tigers will balance 6 ponies?

A. 6

B. 9

C. 10

D. 12

c) If 2 ponies and 2 bears are placed on the left side, how many tigers are needed on the right side to balance the seesaw?

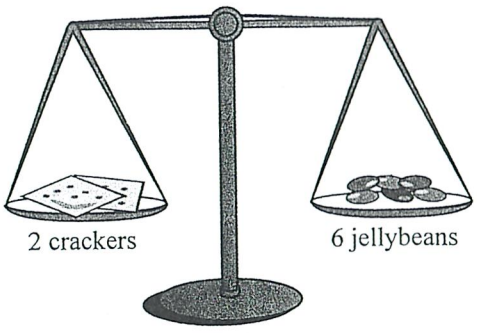
A. 9

B. 10

C. 12

D. 15

Use the following information to answer the next question.



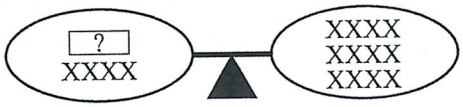
The given balance scale shows that the mass of two crackers is equal to the mass of six jellybeans.

17. If the number of crackers is multiplied by 4, how many jellybeans would be needed to balance the scale?

A. 12 **B.** 18

C. 24 **D.** 28

Use the following information to answer the next question.



Written Response

18. If each **X** on the balance scale is equal to 2 g, then what is the mass of the rectangle?

Answers and Solutions – Unit Test

1. D	5. B	9. A	13. D	b) B
2. C	6. A	10. A	14. C	c) A
3. A	7. WR	11. B	15. 11	17. C
4. B	8. A	12. A	16. a) A	18. WR

1. D

To find the correct table, look at each **In** term and divide it by 2 to see if the **Out** terms match the pattern rule.

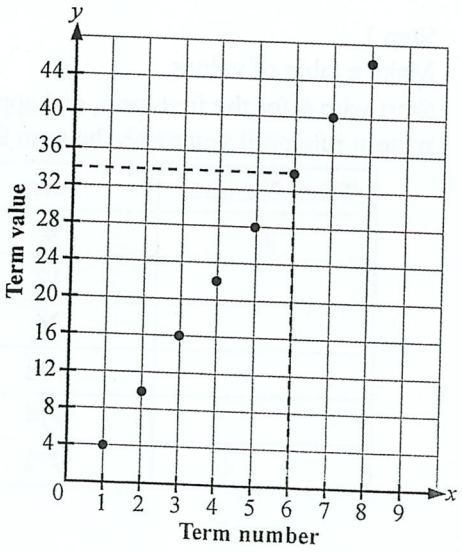
In A $76 \div 2$ does not equal 39, and therefore does not follow the pattern rule.

In B $98 \div 2$ does not equal 48, and therefore does not follow the pattern rule.

In C $68 \div 2$ does not equal 35, and therefore does not follow the pattern rule.

In D all of the **In** numbers divided by 2 equal the corresponding **Out** numbers, and therefore follow the pattern rule.

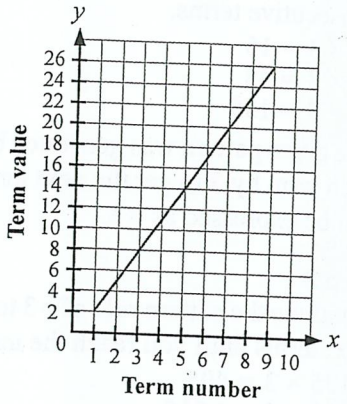
2. C



As shown in the graph, the term number that corresponds with the term value 34 is 6.

3. A

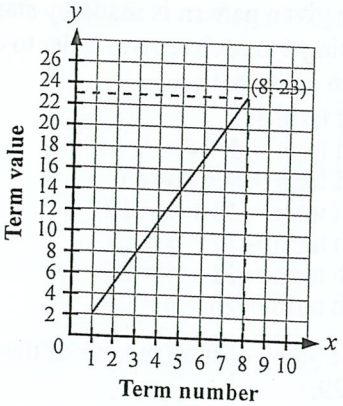
The pattern can be continued by extending the line.



In this graph, the horizontal axis (x-axis) represents the term numbers, and the vertical axis (y-axis) represents the term values of the pattern.

Since the corresponding term number for the term value 23 needs to be found, draw a line parallel to the x-axis such that it cuts the y-axis at point 23.

From the point of intersection of this line and the line representing the pattern, draw a line parallel to the y-axis onto the x-axis.As shown in the graph, the vertical line cuts the x-axis at term number 8.



This implies that the corresponding term number for the term value 23 is 8; in other words, the 8th term of the given pattern has a term value of 23.

4. B

Step 1
Determine the constant by which the term values increase.
To do this, you need to determine the relationship between every two consecutive terms.
$5 \times 3 = 15$
$15 \times 3 = 45$
$45 \times 3 = 135$
The given pattern was generated by multiplying each term by 3 to get the next term. This rule can be expressed as $\times 3$.

Step 2
Continue the pattern rule of $\times 3$ to determine the next terms until you reach the term 10935.
$135 \times 3 = 405$
$405 \times 3 = 1\,215$
$1\,215 \times 3 = 3\,645$
$3\,645 \times 3 = 10\,935$

Step 3
Determine the term number that corresponds to the term value of 10935.
The first four terms were given:
5, 15, 45, 135.
You determined the next four terms:
405, 1 215, 3 645, 10 935.
$4 + 4 = 8$
The 8th term has a value of 10935.

5. B

The given pattern is made by starting at 5 and adding 4 to each term in order to obtain the next term of the pattern.
1st term = 5
2nd term = $5 + 4 = 9$
3rd term = $9 + 4 = 13$
4th term = $13 + 4 = 17$
5th term = $17 + 4 = 21$
6th term = $21 + 4 = 25$
7th term = $25 + 4 = 29$

The value of the 7th term of the given pattern is 29.

6. A

Step 1
Before you can extend the pattern, you need to determine the pattern rule being used. Examine how the numbers change from term to term.
$3 \times 2 = 6$
$6 \times 2 = 12$
The pattern rule is multiply each term by *2* to get the next term.

Step 2
Continue the pattern rule to determine the 4th to 8th term numbers.

Term Number	Term
4	24
5	48
6	96
7	192
8	384

The numeral 384 will be the 8th term.

7. WR

Step 1
Make a table of values.
Start with 4 for the first term, and apply the pattern rule until you reach the term 972.

Term Number	Term
1	4
	12
	36
	108
	324
	972

Step 2
Work your way through each statement to determine which one is false.
Since 2 ponies = 3 tigers, the statement that two ponies are heavier than three tigers is false. Statement A is the false statement.
Calculate the number of ponies you need to balance 3 bears. Multiply 3 bears by 2 to get 6.
6 ponies = 3 bears
Therefore, 7 ponies are heavier than 3 bears. Statement B is true.
If 3 tigers = 1 bear and 2 ponies = 1 bear, then 3 tigers = 2 ponies. Statement C is true.
From the seesaws, 1 bear weighs the same as 2 ponies and the same as 3 tigers. Statement D is true.

b) B

Step 1
Determine the equivalencies of the three animals.
As shown in the given diagram, the weight of two ponies is equal to the weight of one bear.
2 ponies = 1 bear
The weight of three tigers is equal to the weight of one bear.
3 tigers = 1 bear
Because the weight of 2 ponies and the weight of 3 tigers are each equal to the weight of 1 bear, the weight of 2 ponies is equal to the weight of 3 tigers.
2 ponies = 3 tigers

Step 2
Calculate the number of tigers that would equal the weight of 6 ponies.
Multiply 2 ponies by 3 to equal 6 ponies. Also, multiply the number of tigers (3) by 3 to preserve equality.
2 ponies × 3 = 3 tigers × 3
6 ponies = 9 tigers

c) A

Step 1
Determine the equivalencies for the weights of the animals.
2 ponies = 1 bear
3 tigers = 1 bear
3 tigers = 2 ponies
9 tigers = 6 ponies

Step 2
Calculate how many tigers would be needed to balance the weight of 2 ponies and 2 bears.
Use the equivalencies to determine how many ponies are equal to 3 tigers.
2 ponies = 3 tigers
Since 1 bear = 3 tigers, multiply 1 bear by 2 and 3 tigers by 2 to calculate how many tigers are equal to 2 bears.
1 bear × 2 = 3 tigers × 2
2 bears = 6 tigers

Step 3
Add the number of tigers together.
3 + 6 = 9
Nine tigers are needed on the right side to balance the seesaw.

17. C

Step 1
Identify the relationship between the number of crackers and the number of jellybeans.
An equation that can represent this relationship is 2 crackers = 6 jellybeans.

Step 2
Determine what will happen to the number of jellybeans if the number of crackers is multiplied by 4.
To preserve the equality of the equation, you need to perform the same operation to both sides of the equation. Since you are increasing the number of crackers by multiplying by 4, you also need to multiply the number of jellybeans by 4.
2 crackers × 4 = 6 jellybeans × 4
8 crackers = 24 jellybeans
If the number of crackers is multiplied by 4, then 24 jellybeans will balance the scale.

18. WR

Step 1
Use the inverse operation of subtraction and remove four Xs from each side of the scale. This will preserve equality.
The left side of the scale will now have only the variable (the rectangle).
$4 - 4 = 0$
The right side of the scale will now have eight Xs.
$12 - 4 = 8$
The rectangle on the left side of the scale is equal in value to the eight Xs on the right side of the scale.

Step 2
Since each X is equal to 2 g, count by 2s for each of the eight Xs.
2, 4, 6, 8, 10, 12, 14, 16
The mass of the rectangle is 16 g.

Step 3
You can check that equality has been preserved by replacing the rectangle (in the original equation) with the number 16 and replacing each X with 2.
$16 + (4 \times 2) = 12 \times 2$
$16 + 8 = 24$
$24 = 24$
Since each side of the equal sign (=) has the same value, equality has been preserved.