

Patterns, Relationships, and Algebra Review

Name _____ HR _____

Math 6 White Section B C E F

Date _____

1. Charlotta wrote the equation below on a card.

$$\square \div 8 = 5$$

If Charlotta's equation is true, which of the following is also true?

- A. $\square = 5 \times 8$
- B. $\square = 5 - 8$
- C. $\square = 5 \div 8$
- D. $\square = 5 + 8$

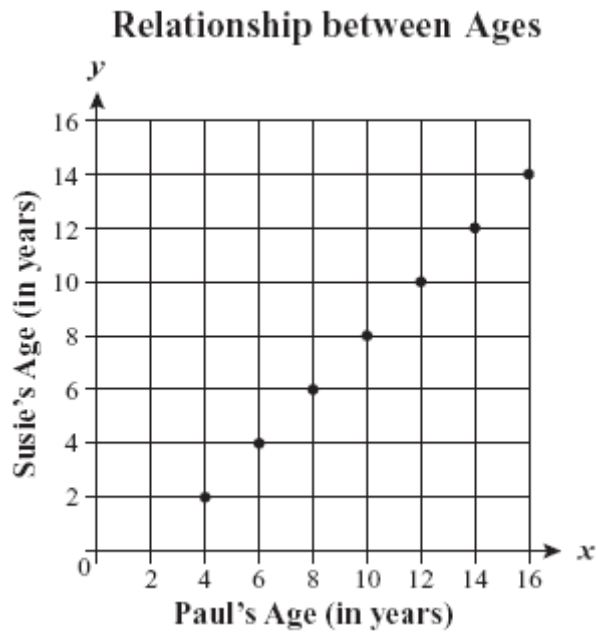
2. Sheila started the geometric pattern shown below.

1, 3, 9, 27, ?

If the pattern continues as shown, what is the next term in the pattern?

- A. 36
- B. 54
- C. 81
- D. 108

3. The graph below represents the relationship between Paul's age and Susie's age.

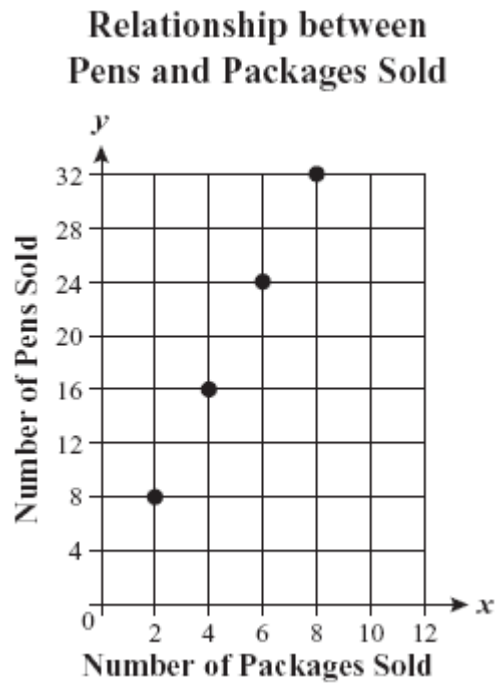


Which of the following best describes the relationship between Paul's age and Susie's age for all the points shown on the graph?

- A. Susie is twice as old as Paul.
- B. Susie is 2 years older than Paul.
- C. Susie is half as old as Paul.
- D. Susie is 2 years younger than Paul.

4. A store sells packages of pens. Each package contains the same number of pens.

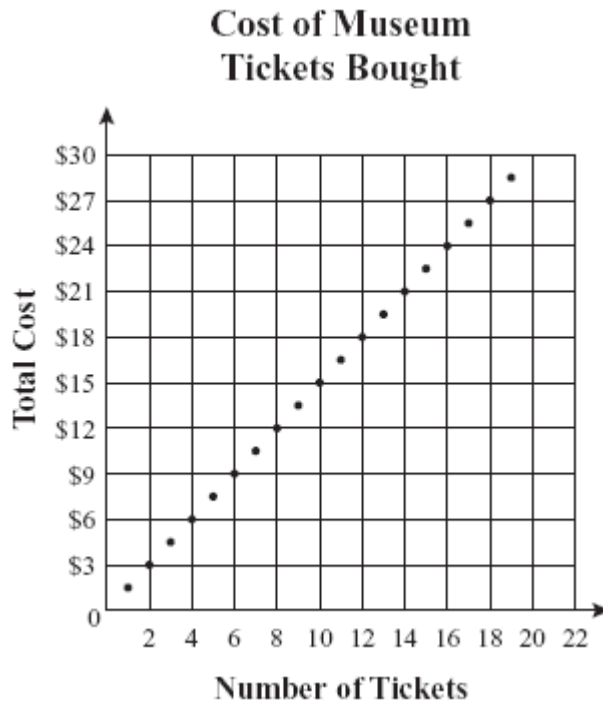
The graph below displays the relationship between the total number of packages sold and the total number of pens sold.



What is the total number of pens in each package?

- A. 2
- B. 4
- C. 6
- D. 8

5. The graph below shows the relationship between the number of museum tickets bought and the total cost of the tickets.



- What is the greatest number of museum tickets that can be bought for \$21?
- What is the cost of 1 museum ticket? Show or explain how you got your answer.
- Using numbers, words, or symbols, write a rule that could be used to find the total cost of any number of museum tickets. You may use n to represent the number of museum tickets bought.
- Calvin bought a one-year museum pass for \$45. The pass allows him to visit the museum an unlimited number of times during one year. What is the least number of times Calvin must visit the museum, during one year, in order for his one-year pass to be less expensive than buying a single museum ticket for each visit? Show or explain how you got your answer.

6. What values of Δ and \square make **both** equations below true?

$$\Delta + 12 = 21$$

$$\Delta + \square = 16$$

A. $\Delta = 8$ and $\square = 8$

- B. $\triangle = 9$ and $\square = 7$
C. $\triangle = 9$ and $\square = 8$
D. $\triangle = 9$ and $\square = 6$

7. The poster below shows the costs at a fall carnival.



Which of the following expressions represents the total cost, in dollars, of 1 admission and r rides, for any number of rides?

- A. $10 + 2r$
B. $10(r + 2)$
C. $10 - 2r$
D. $10 + r + 2$

8. For 4 weeks, Ms. Gonzalez's class collected canned food for a food bank.

- The class collected 16 cans during the first week.
- During each week after the first week, the class collected 12 **more** cans than they had collected the week before.

Based on the information above, which of the following tables correctly displays the number of cans of food the class collected during each week?

A. **Cans Collected by
Ms. Gonzalez's Class**

| Week | Number of Cans Collected during the Week |
|------|--|
| 1 | 16 |
| 2 | 12 |
| 3 | 12 |
| 4 | 12 |

B. **Cans Collected by
Ms. Gonzalez's Class**

| Week | Number of Cans Collected during the Week |
|------|--|
| 1 | 16 |
| 2 | 28 |
| 3 | 40 |
| 4 | 52 |

C. **Cans Collected by
Ms. Gonzalez's Class**

| Week | Number of Cans Collected during the Week |
|------|--|
| 1 | 16 |
| 2 | 12 |
| 3 | 24 |
| 4 | 36 |

D. **Cans Collected by
Ms. Gonzalez's Class**

| Week | Number of Cans Collected during the Week |
|------|--|
| 1 | 16 |
| 2 | 32 |
| 3 | 64 |
| 4 | 128 |

9. Write a rule that describes the relationship between the input (x) and the output (y) in the input-output table below.

| | | | | |
|--------------------------------|---|----|----|----|
| Input (x) | 2 | 5 | 10 | 11 |
| Output (y) | 5 | 11 | 21 | 23 |

10. What is the value of the expression below when $\Delta = 6$?

$$2 + \frac{\Delta}{3}$$

- A. 4
- B. 5
- C. 11
- D. 20

11. If $\Delta = 4$ and $\square = 5$, what is the value of the expression below?

$$3(\Delta) + 6(\square)$$

- A. 9
- B. 18
- C. 39
- D. 42

12. Bridget created the input-output table shown below.

| | | | | | | | |
|--------|---|---|---|----|----|----|----|
| Input | 1 | 2 | 3 | 4 | 5 | 6 | 7 |
| Output | 4 | 6 | 8 | 10 | 12 | 14 | 16 |

Which of the following rules is true for all values in Bridget's input-output table?

- A. $\text{Input} + 3 = \text{Output}$
- B. $\text{Input} \times 3 = \text{Output}$
- C. $(\text{Input} \times 2) + 1 = \text{Output}$
- D. $(\text{Input} \times 2) + 2 = \text{Output}$

13. Based on the pattern in the input-output table below, what is the value of y when $x = 4$?

| Input (x) | Output (y) |
|------------------|-------------------|
| 1 | 7 |
| 2 | 14 |
| 3 | 21 |
| 4 | ? |