Name:

Chapter 1 - Algebra: Number Patterns and Functions - Practice Test

1. **TEST PRACTICE** Justin earned $308 by mowing lawns and raking leaves for a total of 43 hours. He raked leaves for 18 hours and earned $108. Arrange the steps below in a correct order to find how much he earned per hour mowing lawns.

   Step P: Find the difference between $308 and the amount Justin earned raking leaves.
   Step Q: Find the quotient of $200 and the number of hours Justin spent mowing lawns.
   Step R: Find the number of hours Justin spent mowing lawns.

   Which list shows the steps in the correct order?
   A P, R, Q
   B R, Q, P
   C Q, R, P
   D R, P, Q

   Step R: Find the number of hours Justin spent mowing lawns.
   Step P: Find the difference between $308 and the amount Justin earned raking leaves.
   Step Q: Find the quotient of $200 and the number of hours Justin spent mowing lawns.
   The correct answer is D.

   Tell whether each number is *prime*, *composite*, or *neither*.

2. 57

   57 has more than 2 factors, 1, 3, 19, and 57, so it is composite.

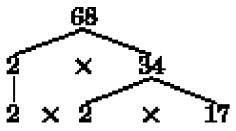
3. 1

   1 has only 1 factor, so it is neither prime nor composite.

4. 31

   31 has only 2 factors, 1 and 31, so it is prime.

5. Find the prime factorization of 68.

   The prime factorization of 68 is $2 \times 2 \times 17$. This can be written as $2^2 \times 17$.

6. **BIRTHDAYS** Miranda told 3 friends that it was her birthday. Each of those 3 friends told 3 other students. By noon, 3^5 students knew it was Miranda's birthday. Write this number as a product of the same factor. Then find the value.

   $3^5 = 3 \times 3 \times 3 \times 3 \times 3$
   $= 243$

Name:

7. $12 - 3 \times 2 + 15$

$$\begin{aligned} 12 - 3 \times 2 + 15 &= 12 - 6 + 15 \\ &= 6 + 15 \\ &= 21 \end{aligned}$$

8. $72 \div 2^3 - 4 \times 2$

$$\begin{aligned} 72 \div 2^3 - 4 \times 2 &= 72 \div 8 - 4 \times 2 \\ &= 9 - 4 \times 2 \\ &= 9 - 8 \\ &= 1 \end{aligned}$$

9. $a + 12$

$$\begin{aligned} a + 12 &= 4 + 12 \\ &= 16 \end{aligned}$$

10. $27 \div b$

$$\begin{aligned} 27 \div b &= 27 \div 3 \\ &= 9 \end{aligned}$$

11. $a^3 - 2b$

$$\begin{aligned} a^3 - 2b &= 4^3 - 2 \cdot 3 \\ &= 64 - 2 \cdot 3 \\ &= 64 - 6 \\ &= 58 \end{aligned}$$

12. **MULTIPLE CHOICE** Latisha and Raquel ordered two beverages for $1.50 each, two dinners for $12.99 each, and a dessert for $3.50. Which of the following expressions can be used to find the amount each should pay, not including tax?

F $1.50 + 2 \times 12.99 + 3.50 \div 2$
G $(2 \times 1.50 + 2 \times 12.99 + 3.50) \div 2$
H $2 \times (1.50 + 12.99 + 3.50)$
J $(2 \times 1.50 + 12.99) + 3.50 \div 2$

(two beverages + two dinners + 1 dessert) ÷ 2
= $(2 \times 1.50 + 2 \times 12.99 + 3.50) \div 2$
The correct answer is G.

Name:

13.

x	■
3	8
7	12
11	16

Study the relationship between each input and output.

Input		Output
3	+ 5 →	8
7	+ 5 →	12
11	+ 5 →	16

The output is 5 more then the input. So, the function rule is $x + 5$.

14.

x	■
0	0
8	1
16	2

Study the relationship between each input and output.

Input		Output
0	÷ 8 →	0
8	÷ 8 →	1
16	÷ 8 →	2

The output is the input divided by 8. So, the function rule is $x \div 8$.

15. **NUTRITION** A medium potato has 26 grams of carbohydrates. Define a variable. Write a function rule that relates the amount of carbohydrates to the number of potatoes.

Let n represent the number of potatoes; $26n$

16. **MONEY** Diego has \$1.30 in quarters, dimes, and nickels. He has the same amount of nickels as quarters, and one more dime than nickels. How many of each coin does he have?

Explore: We are looking for how many quarters, dimes, and nickels Diego has. We know they total \$1.30. We also know that he has the same amount of nickels and quarters, and one more dime than nickels.
Plan: Make a guess until you find an answer that makes sense for the problem.
Solve: Guess 3 quarters, 3 nickels, and 4 dimes. Check the total. $\$0.25 \times 3 + \$0.05 \times 3 + \$0.10 \times 4 = \$1.30$
Check: The answer satisfies the conditions of the original problem.

17. $d + 9 = 14$

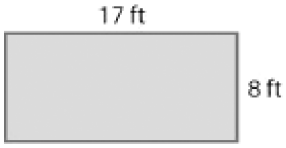
$5 + 9 = 14$, so $d = 5$.

18. $56 = 7k$

$56 = 7 \times 8$, so $k = 8$.

Name:

19. Find the area of the rectangle.



$A = l \times w$

$A = 17 \times 8$

$A = 136$

The area is 136 square feet.

20. **RUGS** Benito has a square rug in his dining room. The length of each side of the rug is 42 inches. Find the area of the rug.

$A = s^2$

$A = 42^2$

$A = 1,764$

The area of the rug is 1,764 square inches.