

Looking Ahead

You will learn how to calculate the number of proper subsets which can be formed from a given set. The order of operations is used when determining how many proper subsets a set has. The exponent should be evaluated before subtracting.

Example Preview

K contains the top organized religions in the world in 2015 according to Infoplease. If $K = \{\text{Christianity, Islam, Hinduism, Buddhism, Sikhism, Judaism, Bahaism, Confucianism, Jainism, Shintoism}\}$, how many proper subsets does K contain?

Solution

If the cardinal number of a set is n , then there are $2^n - 1$ proper subsets contained in the set.

Begin by counting the number of religions in K . You will see that it contains 10 religions. Using the formula for the number of proper subsets, we have the following.

$$\text{Number of proper subsets} = 2^{10} - 1 = 1023$$

2.R.4 Exercises

Concept Check

True/False. Determine whether each statement is true or false. If a statement is false, explain how it can be changed so the statement will be true. (**Note:** There may be more than one acceptable change.)

1. The product of zero and an integer is undefined.
2. If a negative integer is divided by a positive integer, the result will be a negative number.
3. When zero is divided by any nonzero integer, the result is zero.
4. If there are no grouping symbols, multiplication should always be performed before division.

PracticeMultiply.

5. $0(-5)$

6. $(-5)(3)(-4)$

Divide.

7. $\frac{-12}{3}$

8. $\frac{35}{0}$

Simplify the expression using the order of operations.

9. $-6^2 + 7(12) - 3^2$

Applications

Solve.

10. Alicia bought shares of two companies on the stock market. She paid \$9000 for 90 shares in one company and \$6600 for 110 shares in another company. What was the average price per share for the 200 shares?
11. In a speech class the students graded each other on a particular assignment. On this speech, three students scored 60, three scored 70, five scored 80, five scored 82, and four scored 85. What was the average score on this speech?

Writing & Thinking

12. If you multiply an odd number of negative numbers together, do you think that the product will be positive or negative? Explain your reasoning.
13. Explain, in your own words, why the following expression cannot be evaluated:
 $(24 - 2^4) + 6(3 - 5) \div (3^2 - 9)$.