

Indicators

Objective:

1.05 Develop fluency in the use of factors, multiples, exponential notation, and prime factorization.

Vocabulary and Resources

exponent	order of operations
base	factor tree
power	divisibility rules
square	greatest common factor
square root (of perfect square)	least common multiple
cube	prime number
cube root (of perfect cube)	composite number
operations with exponents (\times and \div)	

A. Simplify each of the following:

- | | |
|---|--|
| a. $(2.3)^2 + (0.5)^4$ | f. $\frac{4^6}{4^6}$ |
| b. $(6)^2 \cdot (5)^0 + \left(\frac{1}{2}\right)^3$ | g. $\frac{2^3 \cdot 7^5}{2 \cdot 7^3}$ |
| c. $3 + (11)^2 \cdot (0.3)^4$ | h. $(3 \cdot 5^2)^3$ |
| d. $5^6 \div 5^2$ | |
| e. $2^2 \cdot 3^2 \cdot 2 \cdot 2^3 \cdot 3$ | |

B. Write the prime factorization for 72 in two different ways (include exponential notation).

C. Shanika and Jarvis are making bead bracelets to sell in a booth at the fair. They have 15 yellow beads, 30 blue beads, and 40 red beads. How many blue beads should be on each bracelet if they want to make the bracelets so they are all the same and they use all the beads. How many bracelets will they make?

D. Jason is filling grab bags for the school festival. Two hundred bags are lined up on a long table. He has already placed crackers and other food items in each bag and now has a limited amount of prizes to add to some of the bags. If he places prize A in every 8th bag, prize B in every 12th bag, and prize C in every 15th bag, which bag will have all three prizes?

E. A clockmaker must wind his clocks on a regular schedule. He winds some of his clocks every two days, some of his clocks every three days, and the remainder of his clocks every five days. How often does he wind all of his clocks on the same day?

F. A class of 28 students stood in a circle and counted off by ones. Those students identified with a multiple of four sat down. The remaining students who were standing counted by ones again and this time those identified with a multiple of three sat down. Once again the remaining students counted off and this time the multiples of two sat down. When the third count off was completed, how many students were still standing?

G. The Peterson family is planning a picnic for 16 people. They will be serving hotdogs. If hotdogs come in packages of eight and hotdog buns come in packages of six, what is the minimum amount of each that they should purchase so they have an equal number of hotdogs and hotdog buns and each person can have the same number of hotdogs?

H. The national debt of a country is approximately 10^9 dollars. If the debt could be reduced by 10^6 dollars per year, about how many years would it take to eliminate the entire debt?