

Name: _____ Date: _____

Can You Fix It?

Prime Factorization

Tyler's math class is studying prime factorization. He completed his homework assignment on prime factorization and showed it to Leeza. She said that in each exercise there was one incorrect number in the prime factorization. Can you help Tyler correct his work? (Hint: Sometimes the incorrect number can be an exponent!)

<input type="radio"/>	1. $2^3 \times 3^3 = 72$	2. $2^2 \times 3^3 \times 5 = 180$
	3. $3^4 \times 11 = 1053$	4. $2^2 \times 3^2 \times 7^2 = 900$
	5. $2^3 \times 3^2 \times 5 = 120$	6. $2^3 \times 5^4 = 1000$
<input type="radio"/>	7. $2^4 \times 5 \times 13 = 624$	8. $3^2 \times 5^2 \times 11 = 315$
	9. $3 \times 5^2 \times 11 = 525$	10. $2 \times 3^2 \times 11 = 594$
	11. $3^2 \times 5^3 = 225$	12. $3^3 \times 13 = 297$
<input type="radio"/>		

Thinking Cap



Leeza told Tyler that for some of the exercises she could tell which number was incorrect by simply looking at the answer. Explain what Leeza meant by this.

Can you Fix It?

Prime Factorization

Topic: Prime Factorization

Objective: To use the calculator to find the prime factorization of numbers.

NCTM Standards: Communication, Reasoning, Number Systems and Number Theory

Using the Activity

Students use the calculator in this activity to find the incorrect number in the prime factorization of a number.

- The x^y key can be used to calculate the powers.

Example For exercise 1, $2 \times^3 3 \times^3 3 \times^3 3 = 216$, so either one of the bases or one of the powers is too high. Try reducing the second exponent to 2. Since $2 \times^3 3 \times^2 3 \times^3 2 = 72$, the correct prime factorization is $2^3 \times 3^2 = 72$.

Assessment Students should be encouraged to use the calculator to check the correct prime factorization they record. They should be sure their result on the calculator is the same as the number to the right of the equal sign in the exercise.

Answers

- See example.
- $2 \times^2 2 \times^3 3 \times^2 2 \times^5 = 180$
- $3 \times^3 4 \times^3 13 = 1053$
- $2 \times^2 2 \times^3 3 \times^2 5 = 120$
- $2 \times^4 4 \times^3 3 \times^3 13 = 624$
- $3 \times^2 5 \times^3 2 \times^3 7 = 525$
- $3 \times^2 2 \times^5 5 \times^2 2 = 225$
- $2 \times^2 2 \times^3 3 \times^2 2 \times^5 5 \times^2 = 900$
- $2 \times^3 3 \times^3 5 \times^3 3 = 1000$
- $3 \times^2 2 \times^5 5 \times^3 7 = 315$
- $2 \times^3 3 \times^3 3 \times^3 11 = 594$
- $3 \times^3 3 \times^3 11 = 297$

Thinking Cap

Answer

Leeza knew that the answer was divisible by certain numbers by using the divisibility rules. If one of those numbers was not included in the prime factorization or if there were numbers other than those included, Leeza knew she needed to change that number.