

Name: \_\_\_\_\_

Date: \_\_\_\_\_

**PRIME FACTORING**  
**N-GEN MATH® 6**



In our last lesson we worked with **factoring** a number, which means writing it as an **equivalent product**.

**Exercise #1:** Factor the whole number 24 in four different ways. Then write all its **factors**.

$24 = \underline{\quad} \times \underline{\quad}$      $24 = \underline{\quad} \times \underline{\quad}$      $24 = \underline{\quad} \times \underline{\quad}$      $24 = \underline{\quad} \times \underline{\quad}$

Factors of 24: \_\_\_\_\_

We also learned that a **prime number** is a whole number larger than 1 that **cannot** be written as the product of **two smaller whole numbers**. Prime numbers are very important.

**Exercise #2:** Of the whole numbers listed below, circle those that are prime numbers.

1 2 3 4 5 6 7 8 9 10 11 12 13 14 15 16 17 18 19 20

Recall that a **composite number** is any non-prime. Because every composite number can be written as a product, we can keep factoring a number until it is **only** the product of prime numbers.

**Exercise #3:** The number 30 is written in its factored form in three different ways. Identify any composite numbers and then factor them as the product of two prime numbers.

(a)  $30 = 2 \times 15 = \underline{\quad} \times \underline{\quad} \times \underline{\quad}$

(b)  $30 = 3 \times 10 = \underline{\quad} \times \underline{\quad} \times \underline{\quad}$

(c)  $30 = 6 \times 5 = \underline{\quad} \times \underline{\quad} \times \underline{\quad}$

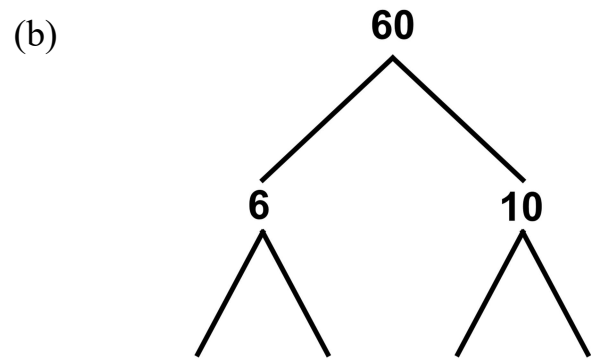
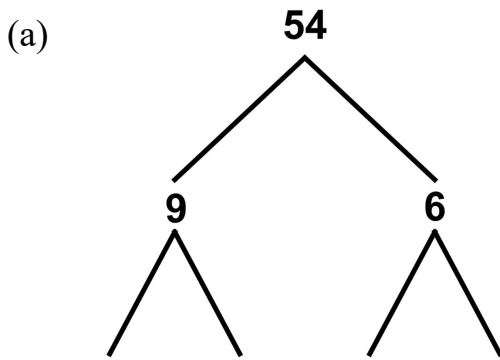
(d) What is true about all three prime factorizations of the number 30?

(e) Why does the order of the prime factors in the product not matter?



When we factor a number so that it is the product of **only prime numbers**, this factorization is **unique**, meaning there is **only one way to do it**. Being able to **prime factor** a number is a useful skill for many future problems. One useful device to help do this is known as a **factor tree**.

**Exercise #4:** The factor tree for two numbers has been started below. Finish it by continuing to factor until there are only prime numbers. Then, write the **prime factorization** of the number.

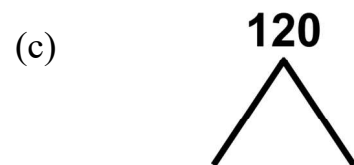


Prime Factorization: \_\_\_\_\_

Prime Factorization: \_\_\_\_\_

Get practice drawing your own factor trees in the next exercise to prime factor the following numbers.

**Exercise #5:** For each whole number below, create a factor tree for each of the following. Then, write the number's prime factorization.



Prime factorization:

Prime factorization:

Prime factorization:



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**PRIME FACTORING**  
**N-GEN MATH<sup>®</sup> 6 HOMEWORK**

**FLUENCY**

1. Which of the following numbers is *not* prime?

(1) 11

(3) 17

(2) 2

(4) 27

\_\_\_\_\_

2. Which number listed is prime?

(1) 33

(3) 57

(2) 43

(4) 62

\_\_\_\_\_

3. Which of the following prime numbers is *not* a factor of 70?

(1) 7

(3) 3

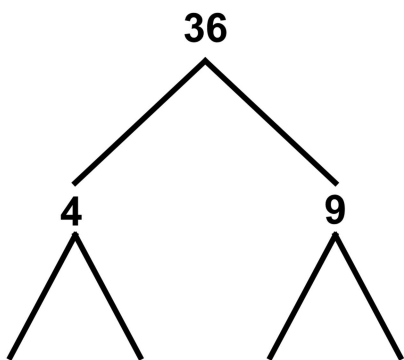
(2) 2

(4) 5

\_\_\_\_\_

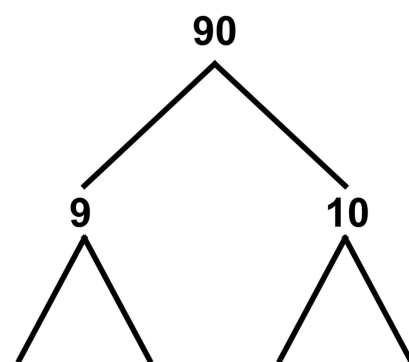
4. For each of the following, finish the factor tree and write the prime factorization of the number.

(a)



Prime factorization:

(b)

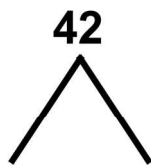


Prime factorization:

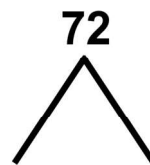


5. For each of the following, create your own factor tree and then give the prime factorization of the number.

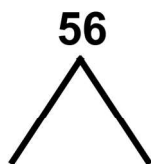
(a)



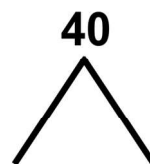
(b)



(c)



(d)



## REVIEWING YOUR MATH

6. Evaluate each of the following:

(a) 
$$\begin{array}{r} 27 \\ \times 45 \\ \hline \end{array}$$

(b) 
$$22 \overline{)792}$$

7. What is the least common multiple of the numbers 9 and 12?

