Answers

M9

REVIEW III

Factoring Numbers

A factor is a whole number that divides another whole number without leaving a remainder.

A prime factor is a prime number that divides another whole number without leaving a remainder.

- Every counting number greater than one has at least two factors: 1 and itself

A prime number is a number that has exactly two factors – 1 and itself.

Examples:

2, 3, 5, 7, 11, 13, 17, 19, 23, 29, 31,

A composite number is a number greater than 1 that has more than two factors.

Example of composite numbers:

4, 6, 8, 9, 10, 12,

Recall: number 1 and number 0 are neither prime nor they are composite!

Task: List all the factors of each number:

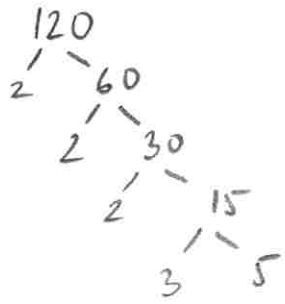
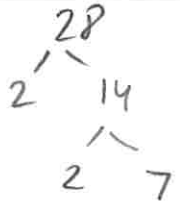
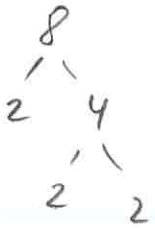
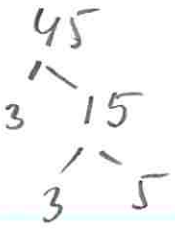
36	56	28
1, 2, 3, 4, 6, 9, 12, 18, 36	1, 2, 4, 7, 8, 14, 28, 56	1, 2, 4, 7, 14, 28

"Rainbow list"

Prime Factorization – Writing Prime Factorization Tree

- Remember to always start with the smallest prime number and if it does not work, use the prime number that follows. Do not skip primes when writing prime factorization tree. Always try if it works before moving onto the next prime.

Task: Write a prime factorization tree for each number. Then use the tree to write the prime factorization statement.

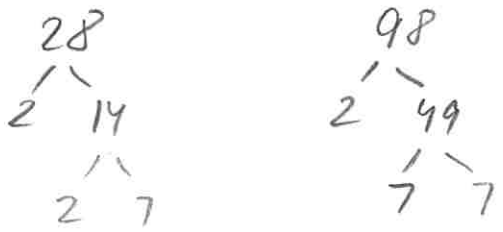
120	28
	
$\therefore 120 = 2\times2\times2\times3\times5$	$\therefore 28 = 2\times2\times7$
8	**45**
	
$\therefore 8 = 2\times2\times2$	$\therefore 45 = 3\times3\times5$

GCF – greatest common factor
"Noodle Method"

To find the greatest common factor of two or more numbers is to find the largest number that divides both or all given numbers.
Steps:

1. Write a prime factorization tree for each given number.
2. Write the prime factorization for each given number.
3. Circle factors that appear in both (or all) lists.
4. Find the product of these factors.
5. State the final answer.

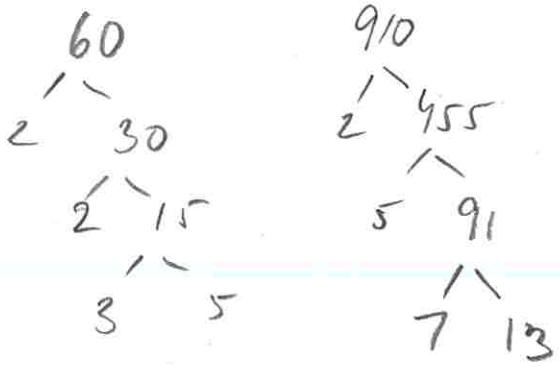
Example: What is the greatest common factor of 28 and 98? Show all your work.



$28 = 2 \times 2 \times 7$
$98 = 2 \times 7 \times 7$

$2 \times 7 = 14$

$\therefore gcf(28, 98) = \underline{14.}$



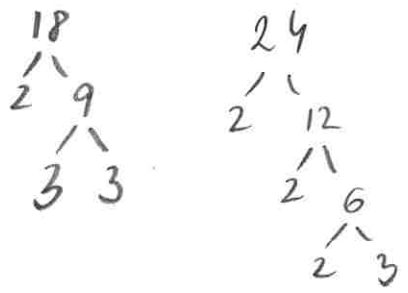
$60 = 2 \times 2 \times 3 \times 5$
$910 = 2 \times 5 \times 7 \times 13$

$2 \times 5 = 10$

$\therefore gcf(60, 910) = \underline{10.}$

Practice: Find the GCF for each pair of numbers. Show all your work.

18, 24



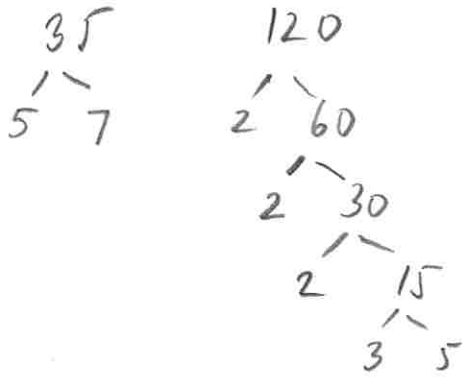
$18 = 2 \times 3 \times 3$

$24 = 2 \times 2 \times 2 \times 3$

$2 \times 3 = 6$

$\therefore gcf(18, 24) = 6.$

35, 120

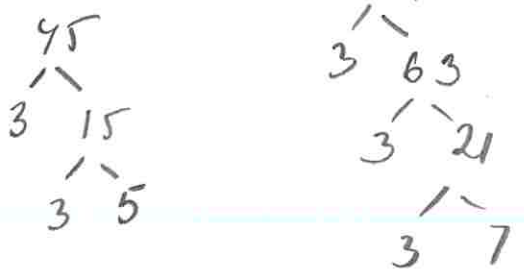


$35 = 5 \times 7$

$120 = 2 \times 2 \times 2 \times 3 \times 5$

$\therefore gcf(35, 120) = 5.$

45, 189



$45 = 3 \times 3 \times 5$

$189 = 3 \times 3 \times 3 \times 7$

$3 \times 3 = 9$

$\therefore gcf(45, 189) = 9$

26, 51

$26 = 2 \times 13$ } no common prime fact

$51 = 3 \times 17$ }

$\therefore gcf(26, 51) = 1$