

PART I GET STARTED

Today's Mathematics

We will find common factors, identify the greatest common factor, and use the GCF in equal-group situations.

Essential Question

How can you find the greatest common factor of two or more numbers?

DO NOW

Review Section 1.4. Find factors and write prime factorizations.

1. List the factor pairs of 16.
2. Prime factorization of 28
3. Prime factorization of 66
4. Evaluate $2^2 \cdot 5 \cdot 7$.

SEE IT

A teacher has 24 pencils and 36 markers to place in identical supply bags with no items left over.

1. What numbers could represent the number of bags?
2. Why must the number of bags be a factor of both 24 and 36?
3. What is the greatest possible number of bags?

QUICK WRITE | 2 MINUTES

Explain what the words greatest, common, and factor each contribute to the meaning of GCF.

PART II INVESTIGATE**ORGANIZE THE FACTORS**

Complete each table. Put shared factors in the common-factors column, then identify the greatest one.

Factors of first	Factors of second	Common factors	GCF
36	48		
16	56		

CONNECT THE METHODS

Prime-factor both numbers in one pair. How do the common prime factors produce the same GCF?

PART III MAKE SENSE AND PRACTICE

WHAT WE CAN CONCLUDE

1. A common factor divides each number with no remainder. 2. The GCF can be found with factor lists or common prime factors. 3. In equal-group situations, the GCF gives the greatest possible number or size of identical groups.

WORKED MODEL

$36 = 2^2 \cdot 3^2$ and $60 = 2^2 \cdot 3 \cdot 5$. The shared prime factors are $2^2 \cdot 3$, so $\text{GCF}(36, 60) = 12$.

FOCUSED PRACTICE

Show a clear strategy and enough work that another student could follow your reasoning.

1. Find the GCF of 18 and 42 using factor lists.
2. Find the GCF of 54 and 126 using prime factorizations.

CHALLENGE

Create a new problem that uses today's idea and has a whole-number answer. Trade with a partner and solve.

MATH WRITE | 5 MINUTES

Compare finding a GCF with factor lists and with prime factorizations. When might each method be useful?

PART IV PUZZLE PRACTICE

Homework

Name _____ Date _____

WHY DID THE HORSE PUT ON A BLANKET?

Find each GCF. Then circle the letter above the matching answer. The circled letters spell the answer.

1. 12, 28

2. 15, 60

3. 9, 24

4. 16, 72

5. 35, 56

6. 33, 46

7. 26, 52

8. 45, 54

9. 42, 54

10. 34, 85

11. 48, 64

12. 77, 121

13. 20, 30, 90

14. 42, 63, 84

15. 36, 54, 108

16. A baseball team has 120 caps, 180 keychains, and 240 bracelets. The items will be split into identical sets with none left over. What is the greatest number of children who can receive a set?

A 99	H 11	E 2	B 31	E 9	G 50	H 5	W 26	I 43	L 29
A 4	T 40	S 17	B 32	A 8	L 25	L 16	B 76	I 10	A 22
T 7	X 55	E 24	T 15	K 34	R 30	L 18	T 28	E 3	A 19
R 100	C 21	R 35	O 6	W 27	L 1	A 81	T 60		