


3-4

Greatest Common Factor

What You'll Learn

To find the GCF of two or more numbers

 **New Vocabulary** common factor, greatest common factor (GCF)

CONTENT STANDARDS

6.NS.4

Get ready for the warm up clicker questions. You might want your 8 page book of divisibility rules handy.



Test the number 375 for divisibility by 2, 3, 5, 9, and 10. Choose the best answer

A

Divisible by 5

D

Divisible by 2, 3, 5, and 9

B

Divisible by 3 and 5

E

Divisible by 2, 3, 5, 9, and 10

C

Divisible by 3, 5, and 9

F

Not divisible by any of these numbers



Simplify four to the third power

A 12

D 64

B 16

E 20

C 32

Why Learn This?

A stamp club president distributes equally one set of 18 stamps and another set of 30 stamps to members present at a meeting. No stamps are left over. You can use factors to find the greatest possible number of club members at the meeting.



To find the greatest possible number of club members, you can find the factors that 18 and 30 share. A factor that two or more numbers share is a **common factor**.

The **greatest common factor (GCF)** of two or more numbers is the greatest factor shared by all the numbers. You can find the GCF of two numbers by listing their factors.

EXAMPLE**Using Lists of Factors**

- 1 Find the greatest common factor of 18 and 30.

List the factors of 18 and the factors of 30. Then circle the common factors.

Factors of 18: ①, ②, ③, ⑥, 9, 18

Factors of 30: ①, ②, ③, 5, ⑥, 10, 15, 30

← The common factors are 1, 2, 3, and 6.

The greatest common factor (GCF) is 6.

Example

- 1 **Using Lists of Factors** Find the greatest common factor of 48 and 64.

List the factors of 48 and the factors of 64. Then circle the common factors.

Factors of 48: ①, ②, 3, ④, 6, ⑧, 12, ⑩, 24, 48

Factors of 64: ①, ②, ④, ⑧, ⑩, 32, 64

← The common factors are

The greatest common factor (GCF) is 16.

1, 2, 4, 8, and 16.

Quick Check

1. List the factors to find the GCF of each pair of numbers.

- a. 6, 21 factors of 6: GCF of 6 and 21:
factors of 21:
- b. 18, 49 factors of 18: GCF of 18 and 49:
factors of 49:
- c. 14, 28 factors of 14: GCF of 14 and 28:
factors of 28:

You can also use the double elevator method to find the GCF.

Find the GCF of 42 and 56.

$$\begin{array}{r|l} 3 & 21 \\ 7 & 21 \\ \hline 2 & 42 \\ & 56 \end{array}$$

There are no common factors of 3 and 4, so gather up the 2 and the 7 and multiply them together to get a GCF of 14

$$2 \times 7 = 14, \text{ the GCF of 42 and 56.}$$

Table talk to find the GCF of 32 and 56.



You want to cut 2 ribbons into several equal-sized pieces with nothing left over. The ribbons are 18 and 42 inches long. What is the longest possible length of ribbon you can cut?

A 2

D 6

B 3

E 7

C 4

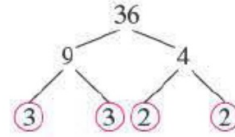
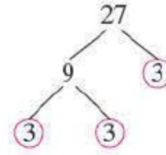
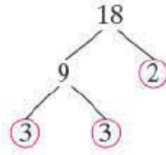
F 12

EXAMPLE Using Factor Trees



- 3 A volunteer divides 18 adults, 27 girls, and 36 boys into groups to clean up the park. He divides the adults, girls, and boys equally among the groups. What is the greatest possible number of groups he can make?

Make a factor tree for each number.



$$18 = 3 \times 3 \times 2$$

$$27 = 3 \times 3 \times 3$$

$$36 = 3 \times 3 \times 2 \times 2$$

← Write the prime factorization for each number.

↑ ↑ Identify common factors.

The GCF of 18, 27, and 36 is 9. The greatest number of groups is 9.

Quick Check

3. Use a factor tree to find the GCF.

a. 48, 80, 128





Check Your Understanding

Match each pair of numbers to the GCF.

3. 18, 3



A. 22

4. 8, 12



B. 3

5. 22, 110



C. 4

Power down your clickers and put them away.
Your assignment is a google form, and you need to log into your crbcrusaders gmail to find the link. <https://docs.google.com/a/crbcrusaders.org/spreadsheet/viewform?formkey=dEQzYzRHLXRTQnFXc3oxRUIzRV80VtE6MQ>

You may use scratch paper, your notes, and your divisibility 8-page book to answer all of the questions. When you are done, hit submit TWICE and when you see the message that says thank you for submitting your google form, you can then log off of your gmail account.