

4-1 Greatest Common Factor - Practice and Problem Solving

Identify the common factors of each set of numbers.

9. 45, 75

List the factors by pairs for each number. Then circle the common factors.

Factors of 45	Factors of 75
1×45	1×75
3×15	3×25
5×9	5×15

The common factors are 1, 3, 5, and 15.

11. 6, 21, 30

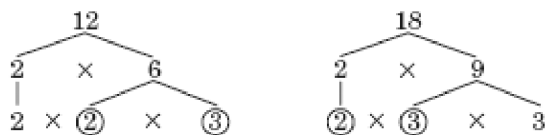
List the factors by pairs for each number. Then circle the common factors.

Factors of 6	Factors of 21	Factors of 30
1×6	1×21	1×30
2×3	3×7	2×15
		3×10
		5×6

The common factors are 1 and 3.

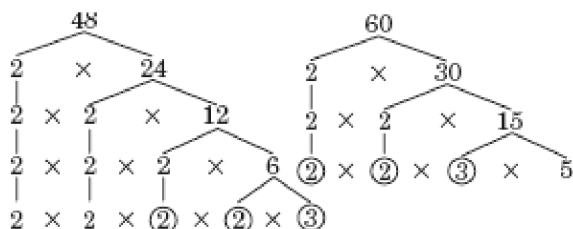
Find the GCF of each set of numbers.

13. 12, 18



The common prime factors are 2 and 3. So, the GCF is 2×3 or 6.

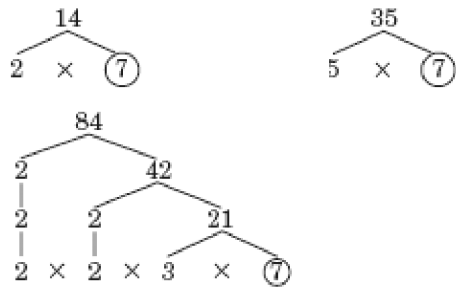
15. 48, 60



The common prime factors are 2, 2, and 3. So, the GCF is $2 \times 2 \times 3$ or 12.

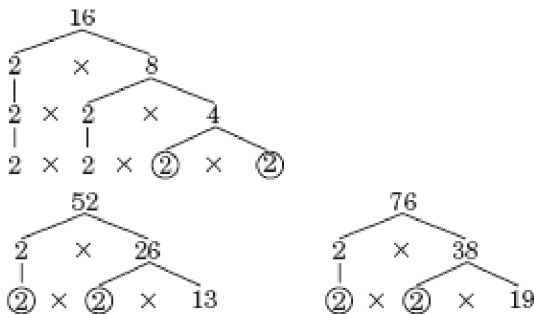
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17. 14, 35, 84



The common prime factor is 7. So, the GCF is 7.

19. 16, 52, 76



The common prime factors are 2 and 2. So, the GCF is 2×2 or 4.

21. 37, 64, 72

Since 37 is a prime number, the only factor the numbers could have in common is 1. So, the GCF is 1.

SCRAPBOOKING Use the following information.

Annika is placing photos in a scrapbook. She has eight large photos, twelve medium photos, and sixteen small photos. Each page will have only one size of photo. She also wants to place the same amount of photos on each page.

23. What is the greatest number of photos that could be on each page? Justify your response.

$$\begin{aligned} 8 &= 4 \times 2 \\ &= \boxed{2} \times \boxed{2} \times 2 \end{aligned}$$

$$\begin{aligned} 12 &= 4 \times 3 \\ &= \boxed{2} \times \boxed{2} \times 3 \end{aligned}$$

$$\begin{aligned} 16 &= 4 \times 4 \\ &= \boxed{2} \times \boxed{2} \times \boxed{2} \times 2 \end{aligned}$$

The greatest number of photos on a page is the GCF of 8, 12, and 16, which is 2×2 or 4.

SHOPPING Use the following information.

A grocery store sells boxes of juice in equal-size packs. Carla bought 18 boxes, Rico bought 36 boxes, and Winston bought 45 boxes.

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25. What is the greatest number of boxes in each pack?

$$18 = 2 \times 9$$

$$= 2 \times \boxed{3} \times \boxed{3}$$

$$36 = 4 \times 9$$

$$= 2 \times 2 \times \boxed{3} \times \boxed{3}$$

$$45 = 9 \times 5$$

$$= \boxed{3} \times \boxed{3} \times 5$$

The greatest number of boxes in each pack is the GCF of 18, 36, and 45, which is 3×3 or 9.

Find three numbers with a GCF that is the indicated value.

27. 6

Sample answer: 12, 18, 24

$$12 = 4 \times 3$$

$$= \boxed{2} \times 2 \times \boxed{3}$$

$$18 = 2 \times 9$$

$$= \boxed{2} \times \boxed{3} \times 3$$

$$24 = 4 \times 6$$

$$= \boxed{2} \times 2 \times 2 \times \boxed{3}$$

The GCF is 2×3 or 6.

29. 15

Sample answer: 30, 45, 60

$$30 = 2 \times 15$$

$$= 2 \times \boxed{3} \times \boxed{5}$$

$$45 = 9 \times 5$$

$$= \boxed{3} \times \boxed{5} \times 5$$

$$60 = 4 \times 15$$

$$= 2 \times 2 \times \boxed{3} \times \boxed{5}$$

The GCF is 3×5 or 15.

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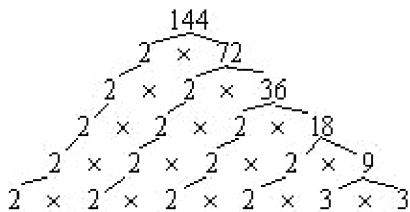
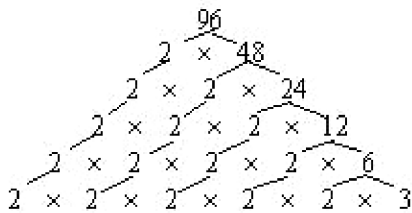
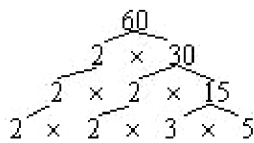
31. **ARTWORK** The table shows the amount of money Ms. Ayala made over three days selling 4×6 -inch prints at an arts festival. Each print cost the same amount. What is the most each print could have cost?

Ms. Ayala's Artwork	
Day	Amount (\$)
Friday	60
Saturday	144
Sunday	96

$$60 = 2 \times 2 \times 3 \times 5$$

$$96 = 2 \times 2 \times 2 \times 2 \times 2 \times 3$$

$$144 = 2 \times 2 \times 2 \times 2 \times 3 \times 3$$



$$60 = 2 \times 2 \times 3 \times 5$$

$$96 = 2 \times 2 \times 2 \times 2 \times 2 \times 3$$

$$144 = 2 \times 2 \times 2 \times 2 \times 3 \times 3$$

$$\text{So GCF} = 2 \times 2 \times 3 = 12$$

The most each print could have cost is \$12.

33. **REASONING** When is the GCF of two or more numbers equal to one of the numbers? Explain your reasoning.

Sample answer: when one of the numbers is a factor of the other number. For example, 5 and 15. The GCF is 5, which is a factor of 15.

CHALLENGE Determine whether each statement is *true* or *false*. If true, explain why. If false, give a counterexample.

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35. The GCF of any two odd numbers is always odd.

True. An odd number does not have a factor of 2. So, the GCF of two odd numbers will not have a factor of 2 and is therefore odd.

37. **OPEN ENDED** Find three numbers with a GCF that is one of the numbers. The sum of the two lesser numbers must equal the greatest number.

Sample answer: 3, 9, 12. Their GCF is three.
 $12 - 9 = 3$.

39. **WRITING IN MATH** Which method would you prefer to use to find the GCF of 48, 64, and 144? Explain your reasoning.

Sample answer: With larger numbers, it is easier to find the prime factorizations to find the GCF.

41. Which number is NOT a common factor of 24 and 36?

A 2
B 6
C 12
D 24

D; List the factors by pairs for each number.

Factors of 24	Factors of 36
1×24	1×36
2×12	2×18
3×8	3×12
4×6	4×9
	6×6

24 is not a factor of 36.

43. **PLAYS** After five performances, the total attendance of a play was 39,963. Which is a more reasonable estimate for the number of people who attended each performance: 7,000 or 8,000?

Use estimation. $40,000 \div 5 = 8,000$
It will cost about \$210 to rent the campsite for a week.

Order each set of decimals from least to greatest.

45. 7, 9.85, 8.3, and 3.9

7 \rightarrow 7.00
9.85 \rightarrow 9.85
8.3 \rightarrow 8.30
3.9 \rightarrow 3.90

The order from least to greatest is 3.9, 7, 8.3, and 9.85.

PREREQUISITE SKILL Tell whether both numbers in each number pair are divisible by 2, 3, 4, 5, 6, or 10.

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47. 9, 24

9 and 24 are divisible by 3 because the sums of the digits of both numbers are divisible by 3.

49. 9, 10

None of the numbers divides both 9 and 10 evenly.