4.2

Greatest Common Factor

BEFORE	Now	WHY?
You found all the factors of a whole number.	You'll find the GCF of two or more whole numbers.	So you can organize bands at a music camp, as in Ex. 32.

A **common factor** is a whole number that is a factor of two or more nonzero whole numbers. The greatest of the common factors is the **greatest common factor (GCF)**.

Relatively Prime Two or more numbers are <mark>relatively prime</mark> if their greatest common factor is 1.

LESSON

4.2 **Practice A**

For use with pages 179–183

1. Name two common factors (other than 1) of the numbers 18 and 24. *ex:* 3 6

2. Give an example of two composite numbers that are relatively prime. *ex* 4, 15

Find the greatest common factor of the numbers.

3. 8, 24

4. 7, 35

5. 14, 21

1   ⑦

1 , 5 , ⑦ 35

6. 22, 55   **7.** 12, 42   **8.** 22, 64

1, 2, 3, 4, ⑥, 12

1, 2, 3, ⑥, 7, 14 21, 42

12
2 $\overbrace{6}$
  2 3

2·2 3

42
   6   7
 2 3

2·3·7

$\begin{array}{c} ② \\ ② \end{array}$ 2 3 7

$\begin{array}{c} 2·3 \\ \hline 6 \end{array}$

9. 16, 36

10. 36, 90

11. 42, 98

36
6   6
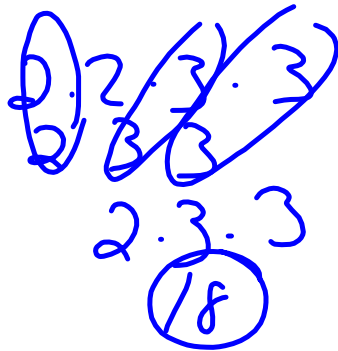2   3   2   3

90
9   10
3   3   2   5

2 · 2 · 3 · 3
3   3

2 · 3 · 3
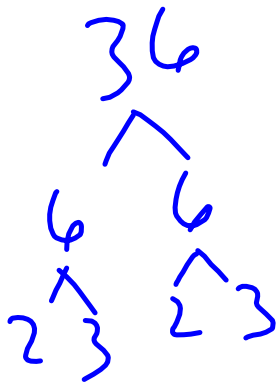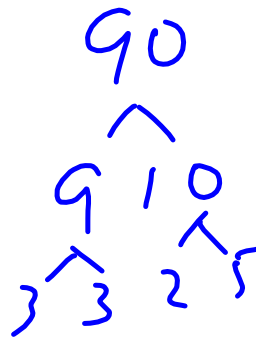
(18)

Find the greatest common factor of the numbers. Then tell whether the numbers are relatively prime.

12. 27, 42

13. 24, 33

$= 3$

NO

14. 22, 35

GCT $= 1$

YES

15. 16, 39

16. 26, 65

$\div 13$

(NO)

17. 54, 55

Find the greatest common factor of the monomials.

18. $3x, 27x$

19. $44n, 28$

44

$4 \wedge 11$

$2 \wedge 2$

$4 \wedge 7$

$2 \wedge 2$

$2 \cdot 2 \cdot 11 \cdot n$

$2 \cdot 2 \cdot 7$

4

20. $16y, 48y^3$

21. $14r^2, 21r^3$ **22.** $9s^3, 27s^4$ **23.** $33z^2, 44z^5$

Handwritten work:

21.

14 → $2 \cdot 7$

21 → $3 \cdot 7$

$2 \cdot 7 \cdot r \cdot r \cdot r$
$3 \cdot 7 \cdot r \cdot r \cdot r$

$7r^2$

22.

9 → $3 \cdot 3$

27 → $3 \cdot 11$

23.

44 → $4 \cdot 11$, 4 → $2 \cdot 2$

$2 \cdot \frac{3}{2} \cdot 11 \cdot z \cdot z \cdot z \cdot z \cdot z$

$11z^2$

Tell whether the numbers are relatively prime.

24. 228, 418

evan

NO

25. 243, 256

26. 17, 374

÷ 17

NO

27. A school has 30 students on its Academic Decathlon team. To practice for the oral Super Quiz portion of the Academic Decathlon, they want to divide into smaller practice teams with equal numbers of students from each grade. There are a total of 6 freshman, 12 sophomores, 4 juniors, and 8 seniors on the team. What is the greatest number of practice teams possible?

a. Write the prime factorization of the number of students in each grade.

b. Find the common prime factors of the numbers.

c. What is the greatest number of practice teams possible?

$$2 \cdot 3 \qquad 2^2 \cdot 3 \qquad 2^2 \qquad 2^3$$
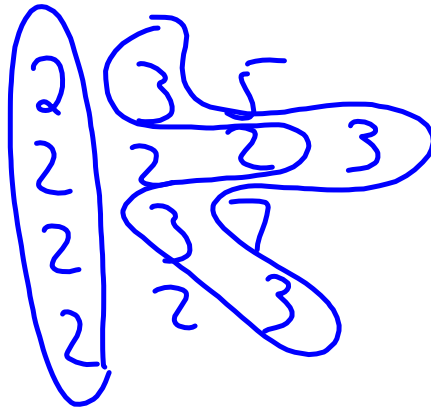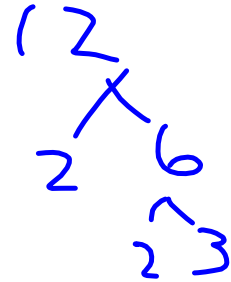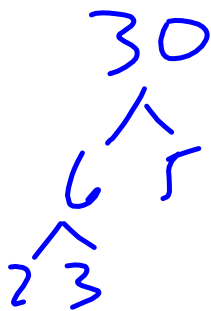
28. You work at a fruit stand. You are putting fruit baskets together. You have 30 oranges, 24 bananas, 42 apples, and 12 peaches. What is the greatest number of identical fruit baskets you can make if you use all of the fruit?

30   24   42   12

6   5   3   8   6   7   2   6

2   3   2   4   2   3   2   3

         2   2

2
2
2
2

3   5
2   2   3
3   7
2   3

2 . 3

6