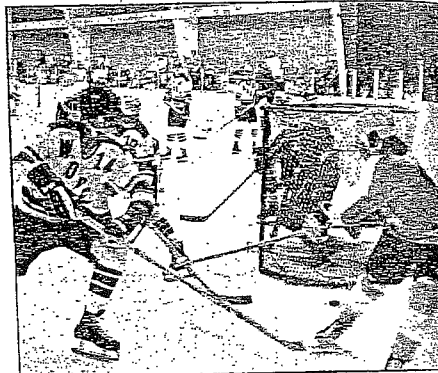


# 5-6 GREATEST COMMON FACTOR (GCF)

The teams from Queen Elizabeth and General Brock schools both went to MacDougals for a snack after their final game. The order placed for each team is shown. We can see items in the order which are common.



	Milk Shakes	Orange Drinks	Root Beers	Fries	Cheese Burgers	Big Burgers	Super Burgers
Queen Elizabeth	(1)	(2)		(6)	11		13
General Brock	(1)	(2)	5	(8)		9	

The items which were common to both orders were milk shakes, orange drinks, and fries. The greatest common item in the order is 6 orders of fries. To find the **Greatest Common Factor (GCF)** of numbers, we list all the factors of each number and select the greatest of the common factors.

### EXAMPLE 1

Find the Greatest Common Factor of 16 and 24.

$$16 - \underbrace{1, 2, 4, 8, 16}$$

$$24 - \underbrace{1, 2, 3, 4, 6, 8, 12, 24}$$

The GCF of 16 and 24 is 8.

### EXAMPLE 2

We may also write the prime factors of the numbers and then find the GCF.

$$16 = \underbrace{2 \times 2 \times 2}_8 \times 2$$

$$24 = \underbrace{2 \times 2 \times 2}_8 \times 3$$

Prime factors common to both products are  $2 \times 2 \times 2 = 8$ .  
The GCF is 8.

### EXAMPLE 3

When the GCF of two or more natural numbers is 1, we say the numbers are **relatively prime**.

$$21 - 1, 3, 7, 21$$

$$25 - 1, 5, 25$$

21 and 25 are relatively prime.

## EXERCISES

1. List the factors of each number. One is done as an example.

32 — 1, 2, 4, 8, 16, 32

- a. 12                      b. 14  
d. 45                      e. 42  
g. 28                      h. 36

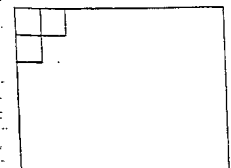
2. List the common factors of each pair of numbers.

- a. 6 and 8  
c. 16 and 24  
e. 15 and 60  
g. 8 and 32

3. Find the GCF of each pair of numbers by listing factors.

- a. 12, 42                      b. 60, 90  
d. 12, 16                      e. 35, 49  
g. 8, 20                      h. 27, 36  
j. 22, 82                      k. 6, 9

4. Several bathroom mirrors are rated with square mirror sizes of the mirrors in centimeters. The dimensions of the mirrors are given. Find the side length of a square mirror tile that can be used to cover the wall exactly.



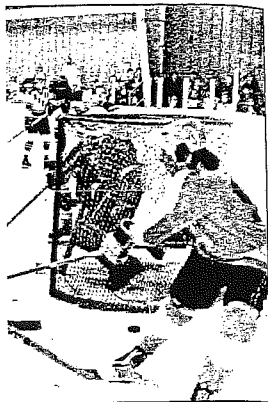
8 m

- a.  $10 \times 25$                       b. 12  
d.  $18 \times 27$                       e. 21  
g.  $180 \times 250$                       h. 56

5. The floor of a rectangular room is to be covered with square tiles. The dimensions of the sides of the tile are given in centimeters. The length and width of the room are given in meters. The tiles must be used exactly.

- a. What are the dimensions of the square tile that will cover the floor exactly?  
b. List 2 other dimensions of square tiles that may be used to cover the floor exactly.

# OR (GCF)



Big Burgers	Super Burgers
	13
9	

## EXERCISES

1. List the factors of each number. The first one is done as an example.

$32 \rightarrow 1, 2, 4, 8, 16, 32$

- a. 12      b. 14      c. 30  
 d. 45      e. 42      f. 18  
 g. 28      h. 36      i. 24

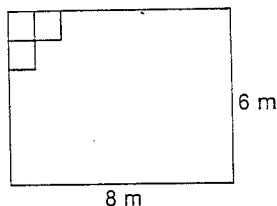
2. List the common factors.

- a. 6 and 8      b. 12 and 20  
 c. 16 and 24      d. 18 and 36  
 e. 15 and 60      f. 24 and 96  
 g. 8 and 32      h. 17 and 51

3. Find the GCF of the following pairs of numbers by listing factors.

- a. 12, 42      b. 60, 45      c. 12, 72  
 d. 12, 16      e. 35, 45      f. 8, 36  
 g. 8, 20      h. 27, 81      i. 25, 60  
 j. 22, 82      k. 6, 93      l. 27, 54

4. Several bathroom walls are to be decorated with square mirrors. The lengths of the sides of the mirrors are multiples of whole numbers. The dimensions of the walls to be covered are given. Find the largest square mirror tile that can be used to cover each wall exactly.



$6 \rightarrow 1, 2, 3, 6$   
 $8 \rightarrow ?$

- a.  $10 \times 25$       b.  $12 \times 16$       c.  $34 \times 51$   
 d.  $18 \times 27$       e.  $21 \times 56$       f.  $24 \times 72$   
 g.  $180 \times 250$       h.  $56 \times 98$       i.  $36 \times 48$

5. The floor of a rectangular shopping mall is to be covered with square tile. The lengths of the sides of the tile are multiples of whole numbers. The mall is 54 m long and 24 m wide.

- a. What are the dimensions of the largest square tile that will cover the mall floor exactly?  
 b. List 2 other dimensions of square tile that may be used to cover the mall floor exactly.

6. Give the GCF of those numbers that are not relatively prime.

- a. 9, 32      b. 34, 51      c. 20, 32  
 d. 17, 18      e. 87, 74      f. 30, 77

7. Find the GCF for each pair of numbers by writing their prime factors.

- a. 24, 32      b. 12, 36      c. 180, 260  
 d. 182, 130      e. 275, 1100      f. 148, 74

8. Find the GCF for each group of numbers.

- a. 8, 12, 16      b. 9, 30, 42  
 c. 25, 15, 65      d. 34, 136, 51  
 e. 26, 52, 65      f. 86, 87, 88

9. In a good-will drive, 42 items of food and 28 items of clothing were collected.

- a. What was the largest number of packages that could be made up containing the same number of food items and the same number of clothing items in each box?  
 b. How many items of food and how many items of clothing would be in each box?

10. There were 20 boys and 28 girls who turned out to form a sports league at school.

- a. What was the largest number of teams that could be formed using the same number of boys and the same number of girls on each team?  
 b. How many boys and how many girls were on each team?

11. A barrel contains 135 red, 351 yellow, and 162 green candles.

- a. What was the largest number of packages that could be made up containing the same number of red, the same number of yellow, and the same number of green candles?  
 b. How many of each colour will be in each box?  
 c. Are there other possible ways to make up the packages? If so, list the number of packages and the number of each colour of candle that will be in each package.