GCD - The Greatest Common Divisor

Introduction

The GCD of 8 and 14 is 2
The GCD of 16 and 24 is 8
The GCD of 6 and -9 is 3

Definition

The GCD of 2 integers **m** and **n** is that positive integer **d** satisfying the following two conditions:
(1) **d** divides **m** and **d** divides **n**
(2) there is no positive integer greater than d with the previous property

Program Development

1. How do you find the find the GCD of a pair of numbers

   Euclidean Algorithm
   Find the GCD of 204 and 156

   Step 1: Divide the large number by the smaller 204÷156 = 1 remainder 48
   Step 2: Divide the previous divisor by the remainder 156÷48 = 3 remainder 12
   Step 3: Divide the previous divisor by the remainder 48÷12 = 4 remainder 0

   The GCD is the last non-zero remainder -> 12

2. Problems

   Find the GCD for the following
   a) 16,34
   b) 8,12
   c) 62,8

3. Developing the VB Code

   a) When do we know we have found the GCD?
      When R=0 (where R is the remainder)

   b) Find a VB expression for the remainder where J and I are the numbers J>I.
      Then R= J - INT(J/I)*I

c) If R=0 then what variable does GCD equal?
GCD=I

d) What happens if we do not obtain R=0 upon our first division?
Then for the second time : I becomes J => J=I
R becomes I => I=R
and we test R=J-int(J/I)*I for R=0

Problems

1. Write a program which will convert a mixed number to an improper fraction in lowest terms.

   1 6/8 = 14/8
   = 7/4

   Assume the mixed number has the form A B/C where A,B, and C are inputted in. If you use any other variables define them clearly in your documentation.

2. Write a program which will add two fractions and put the answer in lowest terms.

   2/4 + 1/8 = 20/32
   = 5/8

   Assume the fractions have the form A/B + C/D where A,B,C and D are input.