

# Worksheet

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Problem quickname: 2001

1)

Determine the greatest common divisor (GCD). Use the Euclidean Algorithm as shown in the example. Write down the computational steps in detail.

a) Number 1: 78, Number 2: 20. Determine the larger number of these: 78.

Round 1:

Determine the quotient and remainder of  $78 : 20$ .

We have  $78 = 3 \cdot 20 + 18$ , so the quotient is 3, the remainder is 18.

Now select the divisor 20 of this round as new dividend and the remainder 18 as new divisor.

Round 2:

Determine the quotient and remainder of  $20 : 18$ .

We have  $20 = 1 \cdot 18 + 2$ , so the quotient is 1, the remainder is 2.

Now select the divisor 18 of this round as new dividend and the remainder 2 as new divisor.

Round 3:

Determine the quotient and remainder of  $18 : 2$ .

We have  $18 = 9 \cdot 2 + 0$ , so the quotient is 9, the remainder is 0.

Finished. The last dividend 2 is also the GCD, so we have  $\gcd(78,20)=2$ .

b) Number 1: 64, Number 2: 20.

c) Number 1: 77, Number 2: 49.

d) Number 1: 27, Number 2: 60.

e) Number 1: 45, Number 2: 38.

f) Number 1: 22, Number 2: 18.

g) Number 1: 56, Number 2: 22.

2)

Determine the greatest common divisor (GCD). Use the Euclidean Algorithm as shown in the example. Write down the computational steps in detail.

a) Number 1: 313, Number 2: 389. Determine the larger number of these: 389.

Round 1:

Determine the quotient and remainder of  $389 : 313$ .

We have  $389 = 1 \cdot 313 + 76$ , so the quotient is 1, the remainder is 76.

Now select the divisor 313 of this round as new dividend and the remainder 76 as new divisor.

Round 2:

Determine the quotient and remainder of  $313 : 76$ .

We have  $313 = 4 \cdot 76 + 9$ , so the quotient is 4, the remainder is 9.

Now select the divisor 76 of this round as new dividend and the remainder 9 as new divisor.

Round 3:

Determine the quotient and remainder of  $76 : 9$ .

We have  $76 = 8 \cdot 9 + 4$ , so the quotient is 8, the remainder is 4.

Now select the divisor 9 of this round as new dividend and the remainder 4 as new divisor.

Round 4:

Determine the quotient and remainder of  $9 : 4$ .

We have  $9 = 2 \cdot 4 + 1$ , so the quotient is 2, the remainder is 1.

Now select the divisor 4 of this round as new dividend and the remainder 1 as new divisor.

Round 5:

Determine the quotient and remainder of  $4 : 1$ .

We have  $4 = 4 \cdot 1 + 0$ , so the quotient is 4, the remainder is 0.

Finished. The last dividend 1 is also the GCD, so we have  $\text{gcd}(389,313)=1$ .

b) Number 1: 578, Number 2: 716.

c) Number 1: 674, Number 2: 460.

d) Number 1: 289, Number 2: 307.

e) Number 1: 789, Number 2: 312.

f) Number 1: 374, Number 2: 846.

g) Number 1: 497, Number 2: 671.

3)

Determine the greatest common divisor (GCD). Use the Euclidean Algorithm and write down the computational steps in detail.

a) Number 1: 36, Number 2: 82.

b) Number 1: 68, Number 2: 85.

c) Number 1: 52, Number 2: 58.

d) Number 1: 90, Number 2: 36.

e) Number 1: 28, Number 2: 76.

f) Number 1: 37, Number 2: 78.

g) Number 1: 74, Number 2: 82.

4)

Determine the greatest common divisor (GCD). Use the Euclidean Algorithm as shown in the example. Write down the computational steps in detail.

a) Number 1: 22, Number 2: 62. Determine the larger number of these: 62.

Round 1:

Determine the quotient and remainder of  $62 : 22$ .

We have  $62 = 2 \cdot 22 + 18$ , so the quotient is 2, the remainder is 18.

Now select the divisor 22 of this round as new dividend and the remainder 18 as new divisor.

Round 2:

Determine the quotient and remainder of  $22 : 18$ .

We have  $22 = 1 \cdot 18 + 4$ , so the quotient is 1, the remainder is 4.

Now select the divisor 18 of this round as new dividend and the remainder 4 as new divisor.

Round 3:

Determine the quotient and remainder of  $18 : 4$ .

We have  $18 = 4 \cdot 4 + 2$ , so the quotient is 4, the remainder is 2.

Now select the divisor 4 of this round as new dividend and the remainder 2 as new divisor.

Round 4:

Determine the quotient and remainder of  $4 : 2$ .

We have  $4 = 2 \cdot 2 + 0$ , so the quotient is 2, the remainder is 0.

Finished. The last dividend 2 ist also the GCD, so we have  $\gcd(62,22)=2$ .

- b) Number 1: 30, Number 2: 69.
- c) Number 1: 70, Number 2: 38.
- d) Number 1: 74, Number 2: 48.
- e) Number 1: 76, Number 2: 38.
- f) Number 1: 21, Number 2: 28.
- g) Number 1: 60, Number 2: 56.

Good Luck!