Greatest Common Factor (divisor)

Greatest Common Factor of two whole numbers is the greatest factor (divisor) that the two numbers have in common.

Two Methods of Finding the GCF

Intersection and the Prime Factorization Method

Alternative for larger numbers

Euclidean Method

Intersection Method

      Find the GCF of 20 and 32;   GCF(20,32)

      Find the GCF of 180 and 168; GCF(189,168)

Prime Factorization Method

      Find the GCF of 20 and 32;   GCF(20,32)

      Find the GCF of 180 and 168; GCF(189,168)

Use factors with smallest exponents

Euclidean Method

Thm.   **If a and b are any whole numbers, a ≥ b, then the GCF(a,b) = GCF(a − b, b)**

Find the GCF(52, 36)

Find the GCF(36, 180)

Find the GCF(180, 24)

Find the GCF(676, 221)

Theorem   If a and b are whole numbers, $a > b$, then the GCF(a,b) = GCF(r,b), where r is the remainder when a is divided by b