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Harsith. S.

Theorem 3.6

If $d = (a,b)$ and d' is any common divisor of a and b, then d'/d

proof :-

Since $d = (a,b)$ using the previous theorem there exists α and β such that $d = \alpha a + \beta b$

Since d'/a and d'/b, $d' / (\alpha a + \beta b)$ So; d'/d

Thus, every common divisor d' of a and b is a factor of their gcd d, and $d' \le d$: Suppose that.

→ d/a and d/b and
→ if d'/a and d'/b, then d'/d, then $d' \le d$
so $d = (a,b)$

An Alternate definition of gcd.

A positive integer d is the gcd of a and b if.

→ d/a and d/b and
→ if d'/a and d'/b, then d'/d, where d' is a positive integer.

Theorem 3.7.

Let a, b and c be any positive integers. Then $(ac, bc) = c(a,b)$.

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Theorem 3.8

Two positive integers a and b are relatively prime if and only if there are integers α and β such that $\alpha a + \beta b = 1$.

proof:-

If a and b are relatively prime, then $(a,b)=1$

there are integers α and β such that $\alpha a+\beta b=1$.
To demonstrate that $(a,b)=1$, let $d=(a,b)$,

$d \mid (\alpha a+\beta b)$ that is $d \mid 1$ so, $d=1$

thus a and b are relatively prime.

Corollary 3.1

if $d=(a,b)$, then $(a/d, b/d)=1$

~~the next corollary follows~~

Corollary 3.2

if $(a,b)=1=(a,c)$ then $(a,bc)=1$