

## Answer on Question #50489, Math, Abstract Algebra

The most important examples of Euclidean domains are the ring  $\mathbb{Z}$  of rational integers and the polynomial ring  $K[x]$  in one variable  $x$  over a field  $K$ .

The most counter examples were:

1) If  $D$  is a unique factorization domain, then the polynomial ring  $D[x]$  in one variable (and therefore in finitely many variables) over  $D$  is a unique factorization domain too

2) For  $D = 1; 2; 3; 7$ , and  $11$ , the ring  $R$  of algebraic integers in the field  $\mathbb{Q}[\sqrt{-D}]$  is a Euclidean domain with the Euclidean norm  $\varphi, \varphi(a) = a\bar{a}$

3) The ring  $R$  of algebraic integers in the complex quadratic field  $\mathbb{Q}[\sqrt{-D}]$  is not a Euclidean domain for  $D = 19; 43; 67$ , and  $163$ .

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