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Gaussian Quadrature with Five- and Six-Point Rules

Subroutine subprograms `RGS56P` and `DGS56P` calculate an approximation and uncertainty for the integral

$$I = \int_a^b f(x)\, dx$$

equal respectively to the mean value and the difference of the results I_5 and I_6 obtained by the five- and six-point Gaussian integration rules.

On CDC and Cray computers, the double-precision version `DGS56P` is not available.

Structure:

`SUBROUTINE` subprograms
User Entry Names: `RGS56P`, `DGS56P`
External References: User-supplied `FUNCTION` subprogram.

Usage:

For `t` = `R` (type `REAL`), `t` = `D` (type `DOUBLE PRECISION`),

```
CALL tGS56P(F,A,B,RES,ERR)
```

`F`	(type according to `t`) Name of a user-supplied `FUNCTION` subprogram, declared `EXTERNAL` in the calling program. This subprogram must set `F(X)` $= f($`X`$)$.
`A,B`	(type according to `t`) End-points of integration interval. Note that `B` may be less than `A`.
`RES`	(type according to `t`) The calculated approximation for I, i.e. $\frac{1}{2}(I_5 + I_6)$,
`ERR`	(type according to `t`) An estimated uncertainty on this approximation, i.e. $\lvert I_5 - I_6 \rvert$.

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