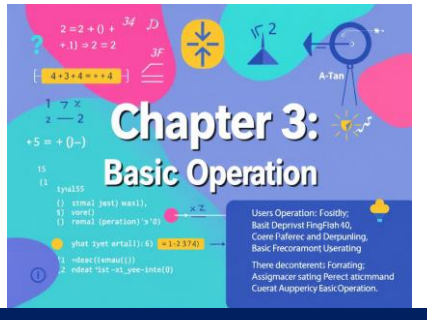
Chapter 3:

Basic Operations



Chapter 3: Basic Operations in Fortran

3.1 Arithmetic Operations

Operation	Symbol	Example
Addition	+	z = x + y
Subtraction	-	z = x - y
Multiplication	*	z = x * y
Division	/	z = x / y
Exponentiation	**	z = x ** y

3.2 Mathematical Functions

Function	Description	Example
ABS(x)	Absolute value	ABS(-5) → 5
SQRT(x)	Square root	SQRT(9.0) → 3.0
EXP(x)	Exponential function (e^x)	EXP(1.0) → 2.718
LOG(x)	Natural logarithm (ln)	LOG(2.718) → 1.0
LOG10(x)	Logarithm base 10	LOG10(100.0) → 2.0
SIN(x)	Sine (radians)	SIN(PI/2) → 1.0
COS(x)	Cosine (radians)	COS(PI) → -1.0
TAN(x)	Tangent (radians)	TAN(PI/4) → 1.0

3.3 Operator Precedence

Fortran follows standard precedence rules:

1. **Parentheses ()**
2. **Exponentiation ****
3. **Multiplication * and Division /**
4. **Addition + and Subtraction -**

Example:

```
x = 5 + 3 * 2  ! x = 11 (Multiplication first)
y = (5 + 3) * 2  ! y = 16 (Parentheses first)
```

Conclusion

- **Syntax rules** ensure that Fortran programs are structured correctly.
- **Variable precision can be increased using DOUBLE PRECISION and KIND.**
- **READ and WRITE are used for user input and output.**
- **Basic operations include arithmetic, relational, and mathematical functions.**