

Fourier

$$\theta \in [-\pi, \pi]$$

$$\mathbf{F}(\theta) \text{ with } \mathbf{F}(\theta) = \mathbf{F}(-\theta)$$

analytic in a strip

$2n$ equispaced points

trigonometric polynomial:

$$\frac{1}{2} \sum_{k=0}^n a_k (e^{i\theta k} + e^{-i\theta k})$$

interp. in equispaced pts

Fourier series:

$$\frac{1}{2} \sum_{k=0}^{\infty} a_k (e^{i\theta k} + e^{-i\theta k})$$

ATAP, Appendix B

Laurent

$$z \in \text{unit circle}$$

$$z = e^{i\theta}$$

$$F(z) \text{ with } F(z) = F(z^{-1})$$

analytic in an annulus

$2n$ roots of unity

Laurent polynomial:

$$\frac{1}{2} \sum_{k=0}^n a_k (z^k + z^{-k})$$

interp. in roots of unity

Laurent series:

$$\frac{1}{2} \sum_{k=0}^{\infty} a_k (z^k + z^{-k})$$

ATAP, Appendix C

Chebyshev

$$x \in [-1, 1]$$

$$x = \cos(\theta) = \frac{1}{2}(z + z^{-1})$$

$$f(x)$$

analytic in an ellipse

$n + 1$ Chebyshev points

polynomial:

$$\sum_{k=0}^n a_k T_k(x)$$

interp. in Chebyshev pts

Chebyshev series:

$$\sum_{k=0}^{\infty} a_k T_k(x)$$

ATAP, chapters 1-21