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## 1.1.11. Дробно-рациональное интерполирование

### а) Метод неопределенных коэффициентов

```
ratIn[l_, r_, f_] := Module[{p, q, n, xlst, lst = {},
  res, Pa, Pb},
  If[l < r, n = r - 1; xlst = Range[1, r, 1.],
  If[r < l, n = 1 - r; xlst = Range[r, 1, 1.],
  Return[Text[Style["Error", 14]]]];
  If[EvenQ[n] == True,
    q = p =  $\frac{n}{2}$ , q =  $\frac{(n-1)}{2}$ ; p = n - q];
  Clear[a, b, x];
  Pa = Normal@Plus @@ (a_# x^# & /@ Range[0, p] [[;; -2]]);
  (*a_0+a_1x+a_2x^2+...+a_px^p*)
  Pa += x^p;
  Pb = Normal@Plus @@ (b_# x^# & /@ Range[0, q]); (*b_0+b_1x+b_2x^2+...+b_qx^q*)
  For[i = 1, i <= n + 1, i++,
    AppendTo[lst, ((Pa - Pb * N[f /. x -> xlst[[i]]) == 0) /. x -> xlst[[i]]];
  (*СЛАУ*)
  res = Flatten@Solve[And@@lst]; (*решение СЛАУ*)
  (Pa = Pa /. #) & /@ res;
  (Pb = Pb /. #) & /@ res;
  { $\frac{Pa}{Pb}$ }]
```

Out[684]=

$f(x)$	$\frac{Pa}{Pb}$	Plot
$\tan[x], x \in [-4, 10]$  $\frac{Pa}{Pb}, x \in [-3, 8]$	$\frac{0. - 3526.33 x + 225.291 x^2 + 475.13 x^3 - 33.8052 x^4 - 11.5813 x^5 + x^6}{-3548.36 + 239.34 x + 1675.18 x^2 - 126.292 x^3 - 93.4144 x^4 + 10.5464 x^5}$	
$\log[x], x \in [2, 10]$  $\frac{Pa}{Pb}, x \in [3, 5]$	$\frac{-0.749469 + x}{1.1598 + 0.296241 x}$	
$1 + \frac{x^2}{2}, x \in [-3, 5]$  $\frac{Pa}{Pb}, x \in [-1, 2]$	$\frac{2. + x^2}{2. + 1.35694 \times 10^{-16} x}$	
$\sin[x], x \in [-5, 10]$  $\frac{Pa}{Pb}, x \in [-4, 8]$	$\frac{0. - 3457.33 x + 353.343 x^2 + 443.642 x^3 - 45.6685 x^4 - 9.45839 x^5 + x^6}{-3457.77 + 353.484 x - 132.01 x^2 + 13.0338 x^3 - 2.88359 x^4 + 0.310036 x^5 - 0.03367 x^6}$	