A business guides itself based on the law of supply and demand to calculate the price of its product on a certain day x. Demand and supply are described by two polynomials proc(x) and ofert(x), respectively. The price of the product is given according to:

$$\text{Preco}(x) = \frac{proc(x)}{ofert(x)} \times \text{Preco\_Base},$$

where Preco_Base = 30.

Create a class Polinomio that contains, at least, the following attributes and methods:

1) **A vector of doubles to store coefficients.**
2) **A constructor by ommission**
3) **A constructor that has a vector of doubles as an argumente**
4) **A method that returns the value of the polynomial for a certain day x.**
5) **A method that allows for you to store the coefficients of the polynomial in a file.**

You should create input and output operators, and an operator to sum polynomials.
The class for error treatment should derive from runtime_error.
The main function should be:

```
int main()
{
    try
    {
        // poli = 3.2 + 2.2 x + 4.1 x^2
        std::vector<double> coef_procura({3.2, 2.2, 4.1})


        Polinomio pol_procura(coef_procura);
        std::cout << "Polinomio procura:\n"<<pol_procura<<std::endl;

        Polinomio pol_oferta;
        std::ifstream fichoferta("ficheiro_oferta.txt");
        if(!fichoferta)
        {
            std::cout << "NON EXISTENT FILE, PLEASE INTRODUCE THE ENTRANCES:\n";
            std::cin>>pol_oferta;
            pol_oferta.GuardarNoFicheiro("ficheiro_oferta.txt");
        }
        else
        {
            fichoferta>>pol_oferta;
            std::cout <<"FILE READ!\n";
            fichoferta.close();
        }
        std::cout<<"Polinomio oferta:\n" << pol_oferta << std::endl;

        double preco_base=30.;

        std::cout << "Preco do produto no dia 100 = "
        << pol_procura.Valor(100)/pol_oferta.Valor(100)*preco_base << std::endl;

        Polinomio competicao = pol_procura+pol_oferta;
        std::cout << "Polinomio da competicao: \n" << competicao << std::endl;
        competicao.GuardarNoFicheiro("competicao.txt");
```

```
        return 0;
    }
    catch (const err& e)
    {
        std::cerr << e.what() << std::endl;
        return 1;
    }
}
```

EXAMPLE OF FIRST RUN:

```
Polinomio procura:
3.2    2.2    4.1
NON EXISTENT FILE, PLEASE INTRODUCE THE
ENTRANCES:
3.2 4.9 a
Ficheiro guardado com sucesso!
Polinomio oferta:
3.2    4.9
Preco do produto no dia 100 = 2507.49
Polinomio da competicao:
6.4    7.1    4.1
Ficheiro guardado com sucesso!
```

EXAMPLE SECOND RUN:

```
Polinomio procura:
3.2    2.2    4.1
FILE READ!
Polinomio oferta:
3.2    4.9
Preco do produto no dia 100 = 2507.49

Polinomio da competicao:
6.4    7.1    4.1
Ficheiro guardado com sucesso!
```