

НОД

Вариант: 2

```
In[50]:= norm[f_] := Module[
  {fom = f, coef = Coefficient[f[x], x, Exponent[f[x], x]]},
  PolynomialQuotient[f[x], coef, x]
]
```

```
In[63]:= f[x_] := 5 * x^4 - 15 * x^3 + 15 * x^2 - 5 * x
g[x_] := -22 * x^5 + 33 * x^4 - 11 * x^3 - 99 * x + 99
fNorm[x_] := norm[f];
gNorm[x_] := norm[g];
```

Нормируем полиномы по старшей степени.

```
In[67]:= bezout[aa_, bb_] := Module[
  {a = aa, b = bb,
   x0 = 1, xx = 0,
   y0 = 0, yy = 1,
   q, r
  },
  While[
    Not[SameQ[b, 0]],
    q = PolynomialQuotient[a, b, x];
    r = PolynomialRemainder[a, b, x];
    {a, b} = {b, r};
    {x0, xx} = {xx, (x0 - xx * q) // ExpandAll};
    {y0, yy} = {yy, (y0 - yy * q) // ExpandAll};
  ];
  {x0, y0, a}
];
```

```
In[68]:= wolframgcd = PolynomialGCD[fNorm[x], gNorm[x]]
{xval, yval, mygcd} = bezout[fNorm[x], gNorm[x]];
Print[mygcd]
```

```
Out[68]= 
$$-\frac{1}{2} + \frac{x}{2}$$

$$-\frac{288}{49} + \frac{288x}{49}$$

```

Видим что полиномы отличаются на константу, проверим тождество Безу

```
In[71]:= Simplify[mygcd] == Simplify[fNorm[x]*xval + yval*gNorm[x]]
Print[xval]
Print[yval]
```

```
Out[71]= True
```

$$-\frac{72}{49} - \frac{216x}{245} + \frac{88x^2}{245} + \frac{16x^3}{35}$$

$$\frac{64}{49} + \frac{16x}{49} - \frac{16x^2}{35}$$