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In[2]:= nonTrivialDivisors = Function[{n}, Complement[Divisors[n], {n, 1}]]
Out[2]= Function[{n}, Complement[Divisors[n], {n, 1}]]

In[3]:= powerOfX = Function[{n}, x^n]
Out[3]= Function[{n}, x^n]

In[4]:= divisorPowersOfX = Function[{n}, powerOfX /@ nonTrivialDivisors[n]]
Out[4]= Function[{n}, powerOfX /@ nonTrivialDivisors[n]]

In[5]:= degreeOfX = Function[{poly}, Exponent[poly, x]]
Out[5]= Function[{poly}, Exponent[poly, x]]

In[6]:= reduceZ2 = Function[{y, poly}, PolynomialRemainder[y, poly, x, Modulus -> 2]]
Out[6]= Function[{y, poly}, PolynomialRemainder[y, poly, x, Modulus -> 2]]

In[7]:= reducedPowersOfX =
  Function[{poly, n}, reduceZ2[#, poly] & /@ divisorPowersOfX[n]]
Out[7]= Function[{poly, n}, (reduceZ2[#, poly] &) /@ divisorPowersOfX[n]]

In[8]:= selectOnes = Function[{poly, n}, Select[reducedPowersOfX[poly, n], # == 1 &]]

Out[8]= Function[{poly, n}, Select[reducedPowersOfX[poly, n], #1 == 1 &]]

In[31]:= isPrimitive =
  Function[{poly},
    deg = degreeOfX[poly];
    Print["Degree ", deg];
    multOrder = 2^deg - 1;
    Print["Order of multiplicative group of GF(2,", deg, ") is ", multOrder];
    IrreduciblePolynomialQ[poly, Modulus -> 2] &&
    Length[selectOnes[poly, multOrder]] == 0
  ]

In[32]:= isPrimitive[x^32 + x^27 + x^26 + x^25 + x^24 + x^23 +
  x^22 + x^17 + x^13 + x^11 + x^10 + x^9 + x^8 + x^7 + x^2 + x^1 + 1]
Degree 32
Order of multiplicative group of GF(2,32) is 4294967295
Out[32]=
True

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