


Chapter 3 / Example 27

Using the roots of a polynomial to factorise

Express the polynomial $f(x) = x^4 - 6x^3 - 19x^2 + 24x$ as a product of linear factors, and check your answer by using your calculator.

Press **MENU** **A**  to enter equation mode.

Press **F2** Polynomial.

Press **F3** 4 since the polynomial is degree 4.

Polynomial
No Data In Memory

Degree?
2 3 4 5 6

Enter the coefficients: 1, -6, -19, 24 and 0.

$a_0 X^4 + a_1 X^3 + \dots + a_4 = 0$
 $\frac{a_0}{1} \quad \frac{a_1}{-6} \quad \frac{a_2}{-19} \quad \frac{a_3}{24} \rightarrow$
 24
SOLVE **DELETE** **CLEAR** **EDIT**

Press **F1** SOLVE.

The calculator shows the roots: 8, -3, 1 and 0.

The factorization is: $f(x) = x(x-1)(x+3)(x-8)$.

$a_0 X^4 + a_1 X^3 + \dots + a_4 = 0$
 X1 8
 X2 1
 X3 0
 X4 -3
 8
REPEAT