

Chapter 3 / **Example 29****Finding complex roots of a polynomial**

Given that  $1 + 3i$  is a complex zero of the polynomial  $f(x) = x^3 - 5x^2 + 16x - 30$ , find all the other zeros of  $f$ .

Check your answers using a calculator.

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

Press **F2** Polynomial.

Press **F2** 3 since the polynomial is degree 3.

Polynomial  
No Data In Memory

Degree?  
2 3 4 5 6

Press **SHIFT** **MENU** SET UP.

Scroll down to Complex Mode with **▼** and use **F2** to set this to a+bi. Press **EXIT** to return to the polynomial screen.

Input/Output: Math  
Frac Result : d/c  
Func Type : Y=  
Angle : Rad  
Complex Mode: a+bi  
Display : Norm1

Real a+bi r∠θ

Enter the coefficients: 1, -5, 16 and -30.

$aX^3 + bX^2 + cX + d = 0$   
a b c d  
1 -5 16 -30  
-30  
SOLVE DELETE CLEAR EDIT

Press **F1** SOLVE.

The calculator shows the roots: 3,  $1 + 3i$  and  $1 - 3i$ .

$aX^3 + bX^2 + cX + d = 0$   
X1 3  
X2 1+3i  
X3 1-3i  
3  
REPEAT