

For the polynomial $f(x) = x^4 + 6x^3 + 5x^2 - 12x$

a) What is the maximum number of zeros the polynomial can have?

4

b) Factor the greatest common factor (GCF) out of all 4 terms, and write the remaining polynomial.

$$f(x) = x(x^3 + 6x^2 + 5x - 12)$$

c) One of the zeros is $x = -4$. What is the factor that corresponds to $x = -4$?

$$(x+4)$$

c) Use the given zero to completely factor the polynomial, writing it in its factored form.

$$\begin{array}{r|rrrr} -4 & 1 & 6 & 5 & -12 \\ & & -4 & -8 & 12 \\ \hline & 1 & 2 & -3 & 0 \end{array}$$

$$f(x) = x(x+4)(x^2 + 2x - 3)$$

$$= x(x+4)(x+3)(x-1)$$

e) List ALL of the zeros of $f(x) = x^4 + 6x^3 + 5x^2 - 12x = 0$

Zeros: 0, -4, -3, 1