

- Construct a 4th-degree polynomial with real coefficients with zeros 2, -5, and $1 + i$ and whose graph passes through (1, 12).

SINCE THE poly. HAS DEGREE 4, THE COMPLETE

LIST OF ZEROS IS

$$x = 2$$

$$x = -5$$

$$x = 1 + i$$

$$x = 1 - i$$

THE poly. MUST HAVE FACTORED FORM

$$f(x) = A(x-2)(x+5)(x-1-i)(x-1+i),$$

WHERE A IS THE NUMBER THAT MAKES $f(1) = 12$.

$$f(1) = A(-1)(6)(-i)(i) = A(6i^2) = -6A = 12$$

↓

$$A = -2$$

$$f(x) = -2(x-2)(x+5)(x-1-i)(x-1+i)$$

↑

$$f(x) = -2x^4 - 2x^3 + 28x^2 - 52x + 40$$