

A. Consider the polynomial function f with a root of $3i$. Find and list all roots.

$$f(x) = x^4 + 4x^3 + 13x^2 + 36x + 36$$

B. Use the roots to write the polynomial in standard form.

$$x = \{2, 3, -9\}$$

C. Use the roots to write the polynomial in standard form.

$$x = \{5, 3 \pm \sqrt{2}\}$$

D. Use the roots and degree to write the polynomial in standard form.

1) $x = \{7i, 9\}$
(degree 3)

2) $x = \{-12, 1 + 9i\}$
(degree 3)

3) $x = \{5, -2 + 5i\}$
(degree 3)

E. Write the equation of a polynomial (in standard form) with the following characteristics:

- 1) $f(5) = 0$
- 2) $f(0) = -3$
- 3) $(x - 9)$ is a factor of the polynomial
- 4) $(x + 8)$ is a factor of the polynomial
- 5) The degree of the polynomial is 3.