

### Answer on Question #42989, Math, Calculus

Write a polynomial function of minimum degree with real coefficients whose zeros include those listed. Write the polynomial in standard form.

4, -8, and  $2 + 3i$

**Solution.** If  $a$  is a zero of the given polynomial then  $(x-a)$  is a factor of this polynomial. Also if the complex number  $a + bi$  is a zero of the polynomial then its conjugate  $a - bi$  is also the zero of this polynomial. Therefore we get

$$\begin{aligned}(x - 4)(x + 8)(x - (2 + 3i))(x - (2 - 3i)) \\&= (x^2 + 4x - 32)(x^2 - (2 - 3i)x - (2 + 3i)x + (2 + 3i)(2 - 3i)) = \\&= (x^2 + 4x - 32)(x^2 - 4x + 13) \\&= x^4 - 4x^3 + 13x^2 + 4x^3 - 16x^2 + 52x - 32x^2 + 128x - 416 = \\&= x^4 - 35x^2 + 180x - 416\end{aligned}$$

**Answer:**  $x^4 - 35x^2 + 180x - 416$ .