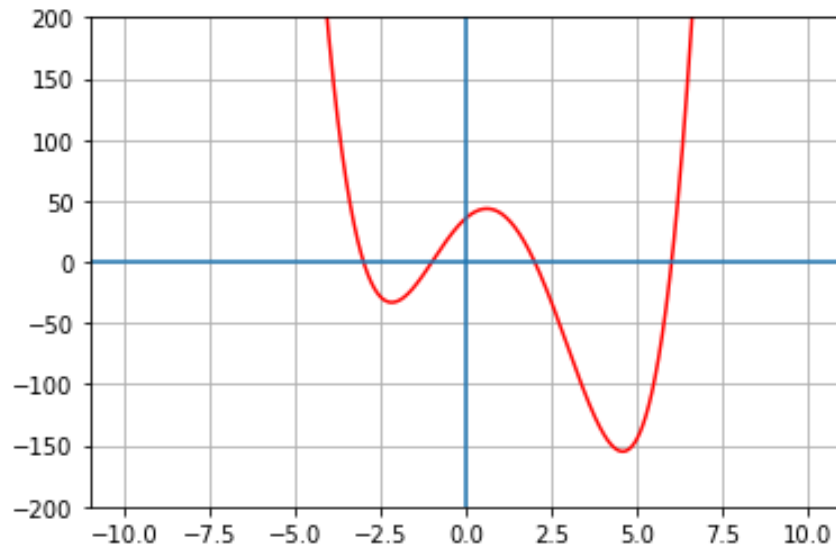# Fundamental Theorem of Algebra

1. What is the minimum degree possible for the polynomial function whose graph is shown in the standard (x, y) coordinate plane below?

   A. 0
   B. 1
   C. 2
   D. 3
   E. 4

2. One of the solutions of the equation $-x^3 - x^2 + x = 0$ is $x = 0$. Which of the following describe the other two solutions?
   A. Both are negative real numbers.
   B. One is a negative real number, and the other is a positive real number.
   C. One is a negative real number, and the other is a complex number that is not real.
   D. Both are positive real numbers.
   E. Both are complex numbers that are not real.

3. Which of the following quadratic equations has the complex number $(2 - i)$ as a solution?
   A. $5x^2 + 4 = 0$
   B. $x^2 + 5x + 4 = 0$
   C. $x^2 - 5x + 4 = 0$
   D. $x^2 + 4x - 5 = 0$
   E. $x^2 - 4x + 5 = 0$

4. What is the solution set of the equation
   $x^4 + x^2 - 20 = 0$?
   A. $\{-5, 4\}$
   B. $\{-5, -2, 2\}$
   C. $\{-\sqrt{5}, 4, \sqrt{5}\}$
   D. $\{-\sqrt{5}, \sqrt{5}, -2i, 2i\}$
   E. $\{-2, 2, -\sqrt{5}i, \sqrt{5}i\}$

5. The graph in the standard (x, y) coordinate plane below is the graph of one of the following functions. Which one?
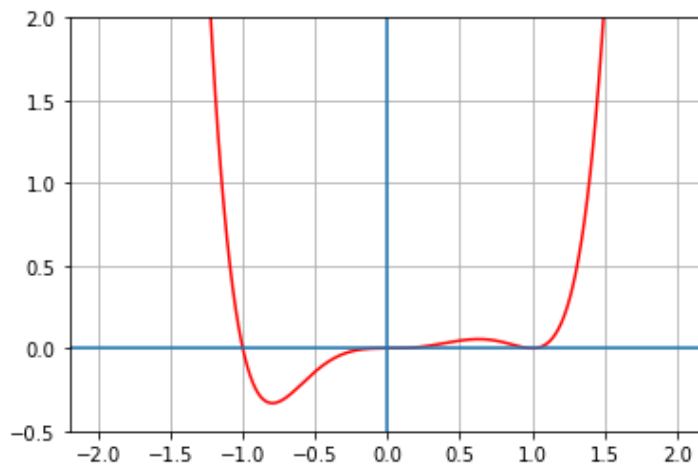
   A. $f(x) = x(x + 1)(x - 1)$
   B. $g(x) = x^2(x + 1)(x - 1)^3$
   C. $g(x) = x^3(x + 1)(x - 1)^2$
   D. $g(x) = x^3(x + 1)^2(x - 1)$
   E. $g(x) = x^2(x + 1)^3(x - 1)$

6. One of the solutions of the equation $x^3 - x^2 + x + 39 = 0$ is $x = -3$. Which of the following describe the other two solutions?
   A. Both are negative real numbers.
   B. One is a negative real number, and the other is a positive real number.
   C. One is a negative real number, and the other is a complex number that is not real.
   D. Both are positive real numbers.
   E. Both are complex numbers that are not real.

7. One of the solutions of the equation $x^3 - x^2 + x + 3 = 0$ is $x = 1 - \sqrt{2}i$. Which of the following describe the other two solutions?
   A. Both are negative real numbers.
   B. One is a negative real number, and the other is a positive real number.
   C. One is a negative real number, and the other is a complex number that is not real.
   D. Both are positive real numbers.
   E. Both are complex numbers that are not real.