

4.6 The Fundamental Theorem of Algebra DAY ONE CYU

Use when you get it right all by yourself

S Use when you did it all by yourself, but made a silly mistake

H Use when you could do it alone with a little help from teacher or peer

G Use when you completed the problem in a group

X Use when a question was attempted but wrong (get help)

N Use when a question was not even attempted

CONCEPTS	BASIC	INTERMEDIATE	ADVANCED
Identifying number of solutions	1, 2		
Rational Root Theorem		3, 4	
Graphing polynomials on the calculator to sketch		3, 4	
Long/synthetic division		3, 4	
Factoring polynomials		3, 4	
Solving polynomial equations		3, 4	
Identifying number of imaginary roots		5, 6	
Writing polynomial functions of least degree			7, 8
Error Analysis with polynomials			9, 10

Identify the number of solutions or zeros.

1. $g(s) = 4s^5 - s^3 + 2s^7 - 2$ **5**

2. $h(x) = 5x^4 + 7x^8 - x^{12}$ **4**

Find all zeros of the polynomial function using the 5 steps from your notes. Show all 5 steps to earn full credit.

3. $f(x) = x^4 - 6x^3 + 7x^2 + 6x - 8$

4. $h(x) = x^3 + 5x^2 - 4x - 20$

1) $\frac{f}{g}$

1)

2) Graph

2)

3) \div

3)

4) Factor

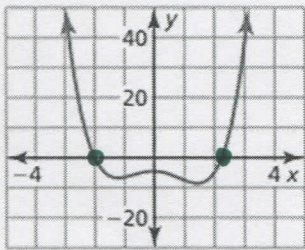
4)

5) $x = -1, 1, 2, 4$

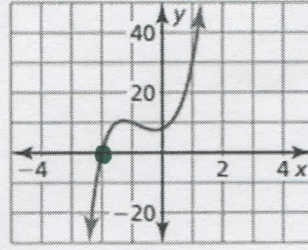
5) $x = -5, \pm 2$

Describe the number of imaginary zeros for the function with the given degree and graph. Explain your reasoning in words.

5. Degree: 4



6. Degree: 5



Write a polynomial function f of least degree that has rational coefficients, a leading coefficient of 1, and the given zeros.

7. $-5, -1, 2$

$$f(x) = x^3 + 4x^2 - 7x - 10$$

8. $3, 4 + i$

$$f(x) = x^3 - 11x^2 + 41x - 51$$

Describe and correct the error in writing a polynomial function with rational coefficients and the given zero(s).

9. Zeros: $2, 1 + i$ forgot $1 - i$

X

$$\begin{aligned} f(x) &= (x - 2)[x - (1 + i)] \\ &= x(x - 1 - i) - 2(x - 1 - i) \\ &= x^2 - x - ix - 2x + 2 + 2i \\ &= x^2 - (3 + i)x + (2 + 2i) \end{aligned}$$

$$f(x) = x^3 - 4x^2 + 6x - 4$$

10. Zero: $2 + i$

X

$$\begin{aligned} f(x) &= [x - (2 + i)][x + (2 + i)] \\ &= (x - 2 - i)(x + 2 + i) \\ &= x^2 + 2x + ix - 2x - 4 - 2i - ix - 2i - i^2 \\ &= x^2 - 4i - 3 \end{aligned}$$

$$f(x) = x^2 - 4x + 5$$

CYU Reflection: How far can you go: basic, intermediate, or advanced?

Rate your mastery level!

How confident are you with the skills this CYU covered? Circle the score you would give yourself.

