

Bellwork Hon Alg 2 Tuesday, January 10, 2017

Use this equation: $x^4 + 3x^3 + x^2 + 15x - 20 = 0$

Find all four Complex Solutions (real and imaginary) by doing the following:

- Find all real solutions by graphing then,
- Use the real zeros to find the remaining imaginary solutions using division.

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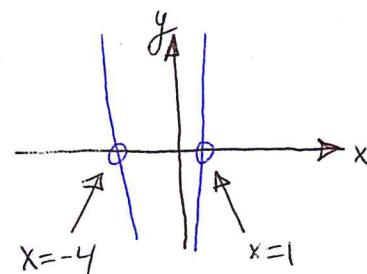
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Real zeros are: $x = -4, 1$

Therefore, factors are $x+4$ & $x-1$



Answers

STEP 3

FIND zeros of $x^2 + 5$:

$$x^2 + 5 = 0$$

$$x^2 = -5$$

$$x = \pm\sqrt{-5} = \pm i\sqrt{5}$$

The 3 factors are $(x+4)(x-1)(x^2+5)$

The 4 solutions are $-4, 1, \pm i\sqrt{5}$

STEP 1

$$\begin{array}{r} x^3 - x^2 + 5x - 5 \\ x+4 \overline{) x^4 + 3x^3 + x^2 + 15x - 20} \\ \underline{-x^4 + 4x^3} \\ -x^3 + x^2 \\ \underline{-x^3 - 4x^2} \\ 5x^2 + 15x \\ \underline{-5x^2 + 20x} \\ -5x - 20 \\ \underline{-5x - 20} \\ 0 \end{array}$$

STEP 2

$$\begin{array}{r} x^2 + 5 \\ x-1 \overline{) x^3 - x^2 + 5x - 5} \\ \underline{-x^3 - x^2} \\ 0 + 5x - 5 \\ \underline{-5x - 5} \\ 0 \end{array}$$