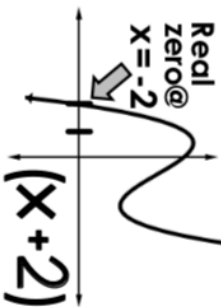


POLYNOMIAL LONG DIVISION

example:

$$P(x) = x^3 - 2x^2 - 3x + 10$$



Start

1 what's missing? $x + 2 \overline{) x^3 - 2x^2 - 3x + 10}$

2 multiply $x^2 - 4x + 5$

3 subtract $-x^3 + 2x^2$

4 bring down $-4x^2 - 3x + 10$

5 repeat steps $-4x^2 - 3x$

$-4x^2 - 8x$

Quadratic
Formula will find
imaginary zeros

$$\begin{array}{r} 5x + 10 \\ -5x + 10 \\ \hline 0 \end{array}$$

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

SYNTHETIC DIVISION

EXAMPLE:

Divide:
 $x^3 - 2x^2 - 8x - 35$
by $(x - 5)$.

ZERO IS 5

GRAB THE COEFFICIENTS

$$x^3 - 2x^2 - 8x - 35$$

MULTIPLY

5	1	-2	-8	-35
		5	15	35
	1	-7	7	0

MULTIPLY 1×5 , 3×5 , 7×5

MULTIPLY ADD REPEAT MULTIPLY ADD REPEAT MULTIPLY ADD REPEAT...

ANSWER $\rightarrow x^2 + 3x + 7$

STEPS

- 1: write the known zero in the house
- 2: list out the coefficients
- 3: bring down the 1st coefficient
- 4: multiply the 1st coefficient by house number
- 5: write the product under the 2nd coefficient
- 6: add down
- 7: repeat
- 8: use final numbers to write polynomial
- 9: use the Quadratic Formula to find the other zeros