

4.1 Solving Polynomial Equations PART 2

**Math Learning Target:**

"By the end of class, I can solve any polynomial equation."

Ex. 1: Use graphing technology (**desmos** or **GeoGebra**) to solve, to the nearest hundredth.

$$21x^3 - 58x^2 + 10 = -18x^4 - 51x$$

$$\text{Let } f(x) = 21x^3 - 58x^2 + 10$$

$$g(x) = -18x^4 - 51x$$

Method 1

$$f(x) = g(x)$$

Find the point(s) where these two functions intersect.

OR

Method 2

Create 1 function: $h(x) = f(x) - g(x)$

Find the **zeros** of this new function; i.e. $h(x) = 0$

$$\begin{aligned} h(x) &= 21x^3 - 58x^2 + 10 - (-18x^4 - 51x) \\ &= 21x^3 - 58x^2 + 10 + 18x^4 + 51x \\ &= 18x^4 + 21x^3 - 58x^2 + 51x + 10 \end{aligned}$$

Confirm with Desmos File, then show using GeoGebra.

the solution is $\{x \in \mathbb{R} / x \doteq -2.71, x \doteq -0.16\}$

Entertainment: p. 204 # *8ac, 7b, 9c, 10, 11**, 13, 15, 16***, 18

* do #8 first

** $x \in \mathbb{W}$ means

x is a Whole number $\mathbb{W} = \{0, 1, 2, 3, \dots\}$

*** wrong answer in back: it should be $x=5, x=-2$ and $x=-3$