Worksheet IIC

Last of the Pre-calculus Exercises

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Questions and Exercises

1. Consider $f(x) = x^3 - x^2$ where $f : \mathbb{R} \longrightarrow \mathbb{R}$.

A. It is what shaped graph?
B. Graph it using PNA for above or below the x-axis.

2. Consider $g(x) = x^2 - x^3$ where $g : \mathbb{R} \longrightarrow \mathbb{R}$.

A. It is what shaped graph?
B. Graph it using PNA for above or below the x-axis.

3. Consider $k(x) = 2x^3 - 9x^2 + 7x + 6$ where $k : \mathbb{R} \longrightarrow \mathbb{R}$.

A. It is what shaped graph?
B. Graph it using PNA for above or below the x-axis.

4. Graph the following systematically. Begin with $f(y) = y^2$ where $f : \mathbb{R} \longrightarrow \mathbb{R}$ and 'track' the point $(0, 0)$ through the different stages of the systematic graphing (see systematic graphic review handout on my Math 181 web-page for a review or reminder of this material):

A. $f_A(y) = 3(y^2 - 5)$ B. $f_B(y) = -2(y + 1)^2 + 4$

C. $f_C(y) = \frac{1}{3}(y - 2)^2 - 1$ D. $f_D(y) = \frac{7}{2}(y)^2 + \pi$

5. Graph $h : (-\infty, ln(10)) \cup [10, \infty) \longrightarrow \mathbb{R}$:

$$h(x) = \begin{cases} \sin x, & x \leq -\frac{\pi}{4} \\ x, & -\frac{\pi}{4} < x \leq 1 \\ e^x, & 1 < x < ln(10) \\ x^3 - 900, & x \geq 10 \end{cases}$$

6. Use linear interpolation to create a rational approximation for $ln(10)$.
7. Use linear interpolation to create a rational approximation for $\sqrt{10}$.
8. Use linear interpolation to create a rational approximation for $\sqrt{403}$.
9. Use linear interpolation to create a rational approximation for $\sqrt{421}$.
10. Use linear interpolation to create a rational approximation for $\sqrt[3]{21}$.
11. Use linear interpolation to create a rational approximation for $\sqrt[4]{21}$.