PC 12 Session 2

January 12, 2022 11:13 AM

Pre-Calculus 12 Session 2
Thursday, January 14, 2022

1. Have you submitted your Student Information Sheet? Your completed Daily Health Check Form? Anybody new?

2. Last Day's Homework: just some readings: Sections 1.1 (pages 6 to 12), 1.2 (pages 16 to 27), 1.3 (pages 32 to 38), 1.4 (pages 44 to 51) from the textbook

3. More about Domain and Range from a graph of a relation, Domain and Range from the equation of a relation, Important "Base Functions" and their Key Points

4. 1.1: Horizontal and Vertical Translations of Functions
   - Horizontal Translations of Graphs of Functions and the Equations of Horizontally Translated Functions
   - Vertical Translations of Graphs of Functions and the Equations of Vertically Translated Functions
   - Combined Translations and Translations of already Translated Functions
   - The Coordinates of Translated Points
   - Translations Review

   } more on this next Day.

5. 1.2: Reflections, Expansions (Stretches) and Compressions of Functions and their Graphs
   - Reflection in the *y*-axis
   - Reflection in the *x*-axis
   - Invariant Points
   - Horizontal and Vertical Expansions and Compressions

6. 1.3: Combining Transformations
   - Does Order Matter?
   - Applying Multiple Transformations
   - Determining the Equation of a Transformed Graph of $f(x)$ from a Graph

Homework: This depends on how far we get today.

Practice from Textbook to try: Try if you'd like to.

Section 1.1: pages 12 to 14, Practise 2, 3c,d, 4a,c, 5, 8, 11.
~~Section 1.2: pages 28 to 30, Practise 3b, 4b, 5, 6, 7, 9, 12.~~
~~Section 1.3: pages 38 to 40, Practise 4, 5a, 6, 7a, b, c, d, 8, 9c, e, 10a, b.~~

Hand-in Assignment: Begin working on the Chapter 1 Hand-in Assignment. It will likely be due on Thursday, January, 19.
(Tues, Jan 25)

End of last time: domain and range.

Determining domain & range from the equation of a function.

→ things to consider when determining the D&R of a function from its equation.

1) You can't ÷ by zero

$f(x) = \frac{1}{x}$ ← $x \neq 0$

$D: \{x \mid x \neq 0, x \in \mathbb{R}\}$
$R: \{y \mid y \in \mathbb{R}\}$

$\sqrt[3]{-8} \neq$ a real number 2) you can't $\sqrt{\ }$, $\sqrt[4]{\ }$, $\sqrt[6]{\ }$ etc, a negative value.

$\sqrt[3]{-8} = -2$

$\sqrt[3]{-8} = -2$ a negative value.

You CAN $\sqrt[5]{}$, $\sqrt[7]{}$, $\sqrt[9]{}$ etc a negative value.

$\sqrt{-1} = i$

$\sqrt{-8} = \sqrt{8} \times \sqrt{-1}$
$= 2.8242\ldots \times i$

Common "Base Functions" and their "key points"

There are a number of functions that you need to become very familiar with:

Chapter 1: Transformations of functions and their graphs.

We are going to look at several kinds of transformations

- horizontal and vertical translations (slides)
- reflections (left to right, top to bottom, etc),
- horizontal and vertical expansions and compressions ("stretches")

Horizontal Translations

If x is replaced by $x-h$ $[h \geq 0, h \in \mathbb{R}]$, in a function $f(x)$, the function is translated h units to the right.

e.g. $y = f(x)$ $\quad y = f(x-5)$

- graphs are the same shape, but each point on the graph of $f(x)$ is moved 5 units to the right.

mapping notation $(x, y) \Rightarrow (x+h, y)$

Vertical translations

If y in the function $y = f(x)$ is replaced

with $y-k$ $(k \geq 0, k \in \mathbb{R})$, then the graph of $f(x)$ is translated k units up

$$(x, y) \rightarrow (x, y+k)$$

$$\left.\begin{array}{l} y-k=f(x) \\ y=f(x)+k \end{array}\right\}$$ a translation of k units up.