Worksheet 1: A Review of PreCalc

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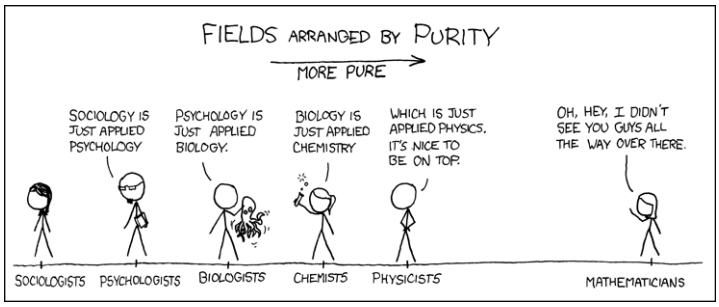

www.XKCD.com

1. Which of the following are functions?
   (a) $f(x) = x^3 + x + 1$
   (b) $f(x) = \begin{cases} 1 & : x \leq 1 \\ 5 & : 1 < x \leq 2 \\ 0 & : x \geq 2 \end{cases}$
   (c) $y = \frac{1}{5}x + \sqrt{7}$
   (d) $x^2 + y^2 = 1$
   (e) $x = f(x)^3$
   (f) $f(x) = cos(x)$
   (g) $x = f(x)^2$
   (h)

x	f(x)
1	1
2	1
3	2
4	3
5	5
6	8

   (i)

x	f(x)
5	1
2	1
6	2
7	3
3	5
42	8
2	2

   (j)
   (k)
   (l)
   (m)
2. For each of the functions in 1, find the function's domain and range.

3. Over which parts of their domain are (e), (h), (k), and (l) increasing?

   (e)

   (h)

   (k)

   (l)

4. Let $f(x)$ be the line intersecting $(-2, 2)$ and $(1, 0)$. Find an algebraic expression for $f(x)$.

5. Sketch the graphs of $f(x) = x^3$, $f(x) = x^3 - 1$, and $f(x) = x^3 + 1$. Note how the graph changed.

6. Define $f(x) = x^2$. Sketch $f(x), f(2x)$, and $f(x + 4)$. Note how the graph changed.

7. Generalize your observations from 5 and 6 for $f(ax), f(x + a)$, and $f(x) + a$ where a is a real number.