

PreCalc 12 Chp 4 Review / Ref Sheet

Note Title

2013-09-29

Combining Functions (Add, Sub, Mult, Div)

$$\begin{aligned}h(x) &= f(x) + g(x) \\h(x) &= f(x) - g(x) \\h(x) &= f(x) \cdot g(x) \\h(x) &= f(x) / g(x)\end{aligned}$$

Domain: use most restrictive.
Extra: exclude NPV's.

Range is more difficult to see. Simplify the function and use minimum and maximum rules.

Sketching: use test or key points: $f(x)$, $g(x) = 0$, ± 1

Finding Functions - usually many solutions, pick EASY ones!

eg) $k(x) = x^4 - 3x^3 + 2x^2 + 10$. Find f , g , & h such that $k(x) = f(x) + g(x) - h(x)$

$$f(x) = x^4 \quad g(x) = -3x^3 \quad h(x) = -2x^2 - 10$$

eg) $h(x) = x^2 - 5x + 6$. Find f & g such that $h(x) = (f \cdot g)(x)$ Factor $x^2 - 5x + 6 = (x-3)(x-2)$

$$f(x) = (x-3) \quad g(x) = (x-2)$$

eg) $h(x) = x^3$. Find f & g such that $h(x) = \frac{f(x)}{g(x)}$

Be careful of domain!

$$f(x) = 3x^3$$

$$g(x) = 3$$

works!

$$f(x) = x^4$$

$$g(x) = x$$

doesn't work: $x=0$ NPV

Composite Functions: When one or more functions are used as inputs to another function.

Recall: generally: $f(g(x)) \neq g(f(x))$

If $f(g(x)) = g(f(x))$ then 'f' and 'g' are inverses.

Domain and Range: Much more difficult than combining functions!

You can reason it out or you can explicitly express the composition to figure it out.

Determine the functions that make up a Composition.

What strategies can you use?

- Use the order of evaluation as the inner functions.
- For quadratics, complete the square for 2 functions.
- Remember - combining fns is not composition