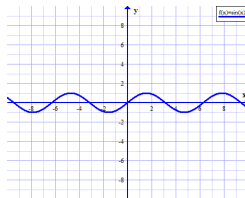


7.1 Combination of Functions

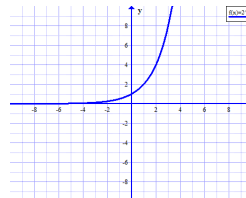
Consider the function shown on the following graph.
What two functions make up this combine function?



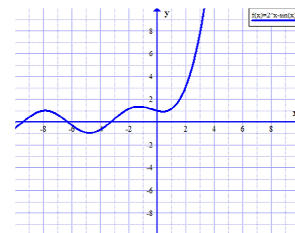
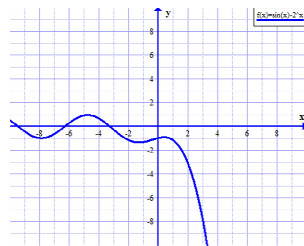
periodic suggests sine or cosine



dramatic change for positive/negative x-values, suggests exponential

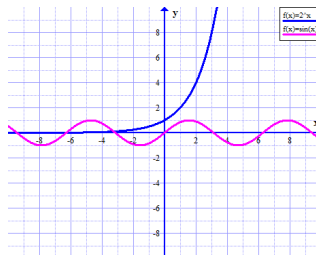


You also have to determine which operation combines the function and the order of the two functions. Consider the following two combined functions.



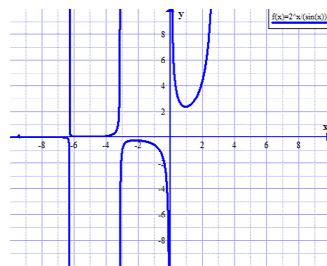
x-intercepts on combined function occur where the graphs intercept, implying subtraction

when $x=3$
pink $y=0$
blue $y=8$
 $0-8=-8$ at $x=3$
 $y=\sin x-2^x$



when $x=3$
pink $y=0$
blue $y=8$
 $8-0=8$ at $x=3$
 $y=2^x-\sin x$

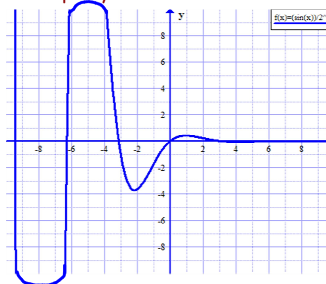
Now, lets look at these two combined functions. Determine the operation which creates the combined function. Notice that both combined functions look very different... yet they have the same operation. Order does matter for subtraction and division. Communicative Property!



asymptotes indicate division

the asymptotes are located at the zeros of the function in the denominator

$$y = \frac{2^x}{\sin x}$$



x-intercepts occurs at the zeros of the function in the numerator

where the y-values of the function are small and the combined graph values are large (vise versa) indicates division

$$y = \frac{\sin x}{2^x}$$

Now you try: Investigation - TWINS

I In groups, match the given pairs of functions with a graph that could be created by combining the functions. Provide justification for each of your matches.

II Using a graphing calculator verify that your matches are correct.



I think they're identical twins, but I am not sure.

Homework:
Page 520 1-3
(#3 complete in class (needs g.c.))