9.3&4 Products and Quotients of Functions

Products: $(f \times g)(x) = fg(x) = f(x) \cdot g(x)$

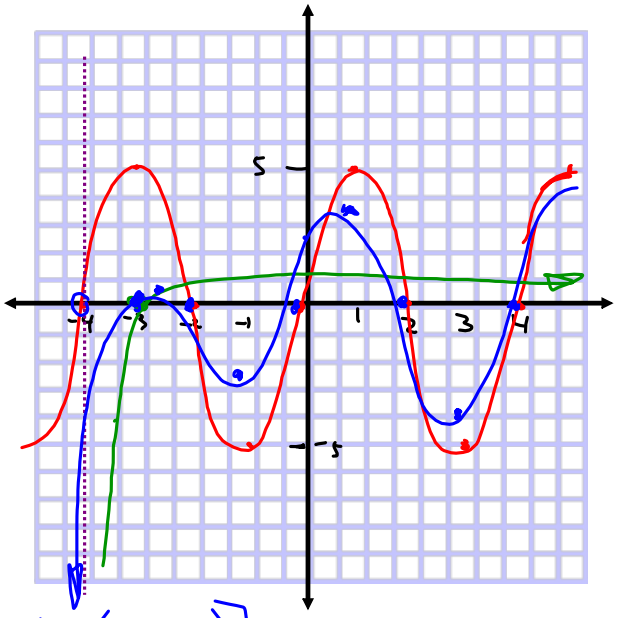
remember ... we are simply multiplying y-values

$K = \frac{\pi}{2}$

If $f(x) = 5\sin(\pi x/2)$, and $g(x) = \log(x + 4)$, graph $f(x) \cdot g(x)$

$T = \frac{2\pi}{\pi/2} = 2\pi \cdot \frac{2}{\pi} = 4$

x	f(x)	g(x)	fg(x)
-5	-5	—	—
-4	0	—	—
-3	5	0	-3.5
-2	0	0.3	0
-1	-5	0.4	-2.5
0	0	.6	0
1	5	.7	3.5
2	0	.8	0
3	-5	.85	-4.25
4	0	.9	0
5	5	.95	4.5
6	0	1	



$(fg)(x) = \log(x+4)[5\sin(\pi x/2)]$

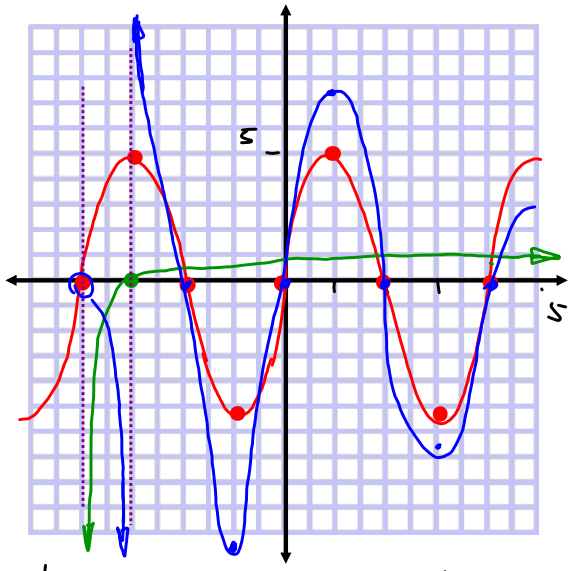
Draw a conclusion about the domain of $f(x) \cdot g(x)$

The domain of $(fg)(x)$ is the overlap (intersection) of the domains of $f(x)$ and $g(x)$

Quotients: $(f / g)(x) = \frac{f(x)}{g} = \frac{f(x)}{g(x)}$

If $f(x) = 5\sin(\pi x/2)$, and $g(x) = \log(x + 4)$, graph $f(x) / g(x)$

x	f(x)	g(x)	(f/g)(x)
-5	-5	—	—
-4	0	—	DNE (0)
-3	5	0	—
-2	0	0.3	0
-1	-5	0.5	-10
0	0	.6	0
1	5	.7	7
2	0	.8	0
3	-5	.85	-6
4	0	.9	0
5	5	.95	5.25
		1	0



* look closely @ what happens on $x \in (-4, -2)$

Draw a conclusion about the domain of $f(x) / g(x)$

domain: $x \in (-4, -3) \cup (-3, \infty)$

domain of $(f/g)(x)$ is overlap again with restrictions where $g(x) = 0$ (likely asymptotes)

Homefun:

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