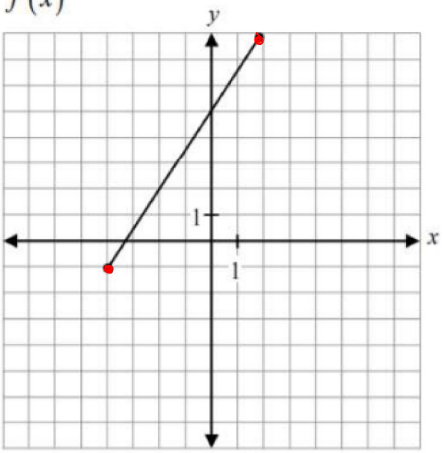
Lesson 2 Combining Functions Graphically

Ex. 1) Given the graphs of $f(x)$ and $g(x)$, sketch $h(x) = (g - f)(x)$

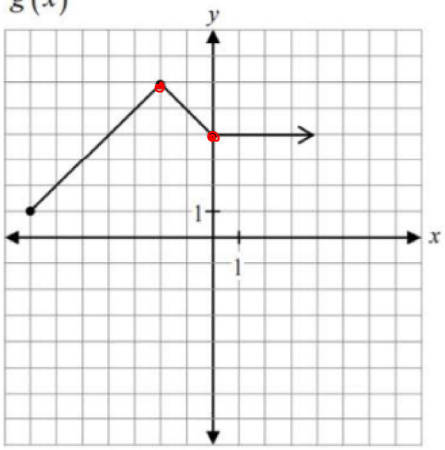
$h(x) = g(x) - f(x)$

$f(x)$



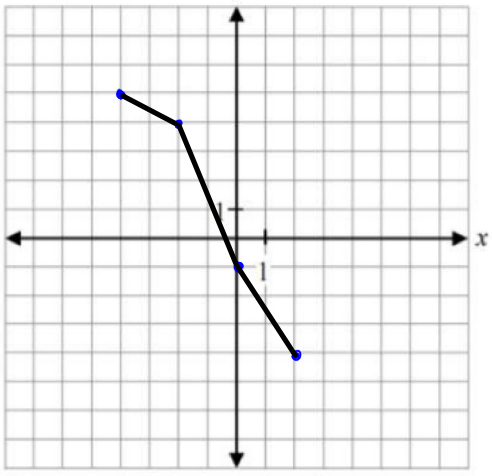
domain: $[-4, 2]$

$g(x)$



domain: $[-7, \infty)$

$g(x) - f(x)$ domain $[-4, 2]$

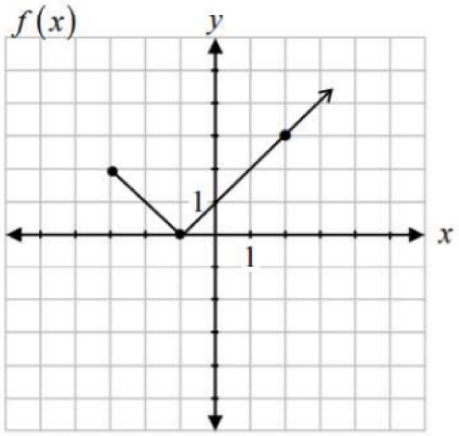


y-values

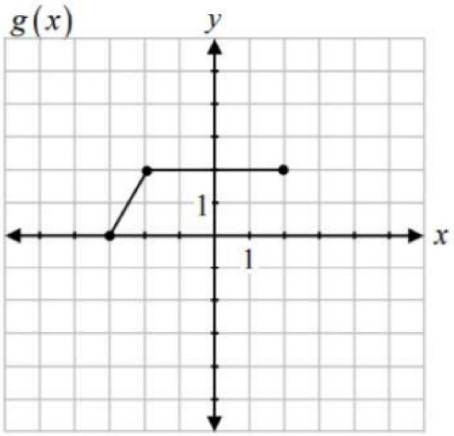
x	$g(x)$	$f(x)$	$(g-f)(x)$	
-4	4	-1	5	$(-4, 5)$
-2	6	2	4	$(-2, 4)$
0	4	5	-1	$(0, -1)$
2	4	8	-4	$(2, -4)$

plot

Ex.2) Given the graphs of $f(x)$ and $g(x)$, sketch $h(x) = f(x) + g(x)$.

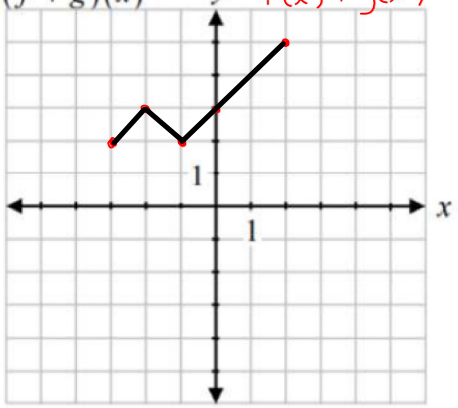


D: $[-3, \infty)$



D: $[-3, 2]$

$(f+g)(x)$ → $f(x) + g(x)$



D: $[-3, 2]$

x	f(x)	g(x)	(f+g)(x)
-3	2	0	2
-2	1	2	3
-1	0	2	2
2	3	2	5

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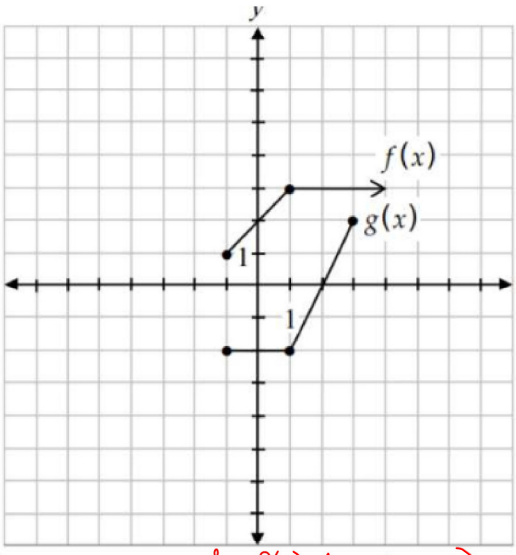
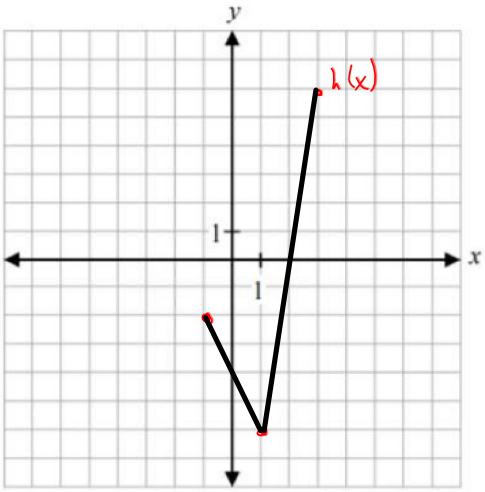
Ex. 3) Given the graphs of $f(x)$ and $g(x)$, sketch $h(x) = f(x) \cdot g(x)$.



Domain of $f(x)$ is $[-1, \infty)$
Domain of $g(x)$ is $[-1, 3]$



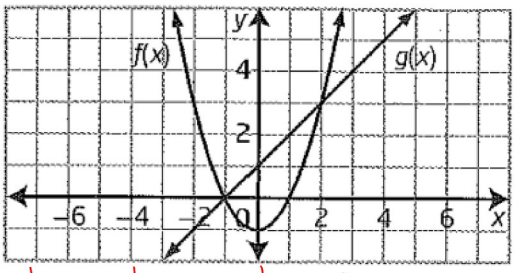
∴ domain of $h(x)$ is $[-1, 3]$

Ex 4) Given the graphs of $f(x)$ and $g(x)$,

a) sketch the graph of $h(x) = \frac{f(x)}{g(x)}$.

$g(x) \neq 0$

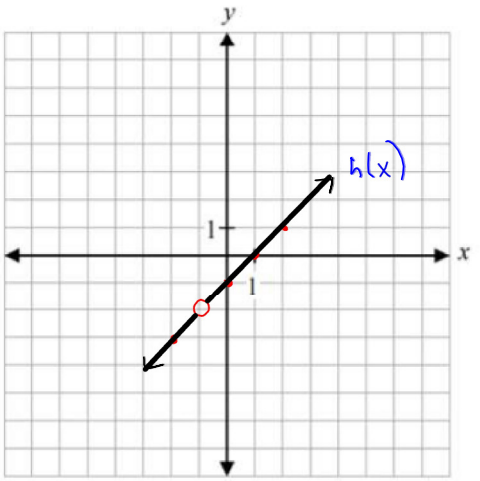
parabola x^2
line x
∴ line x



x	f(x)	g(x)	h(x)
-2	3	-1	-3
-1	0	0	undefined (hole)
0	-1	1	-1
1	0	2	0
2	3	3	1

b.) Determine $(f + g)(2)$

$f(2) + g(2)$
$3 + 3$
6



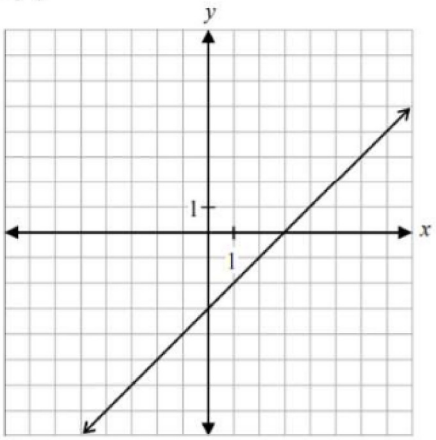
$f(x)$ D: $(-\infty, \infty)$
$g(x)$ D: $(-\infty, \infty)$

domain of $h(x)$:
$x \neq -1$

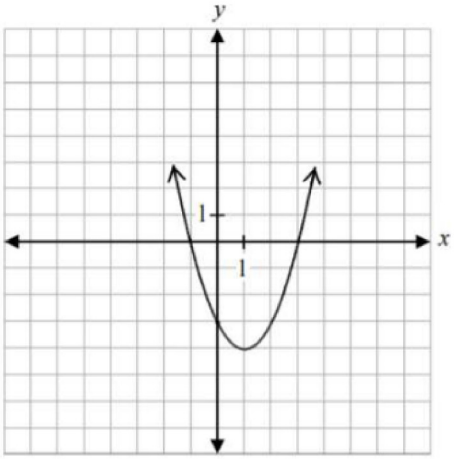
Ex. 5) Given the graphs of $f(x)$ and $(f \cdot g)(x)$, sketch the graph of $g(x)$.

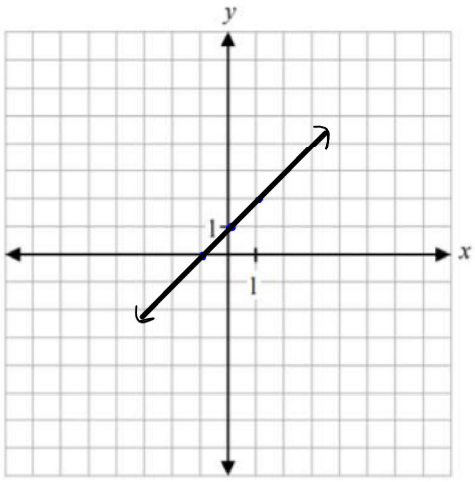
↳ $g(x) = \frac{(f \cdot g)(x)}{f(x)}$

$f(x)$



$(f \cdot g)(x)$





x	$(f \cdot g)(x)$	$f(x)$	$g(x)$
-1	0	-4	0
0	-3	-3	1
1	-4	-2	2