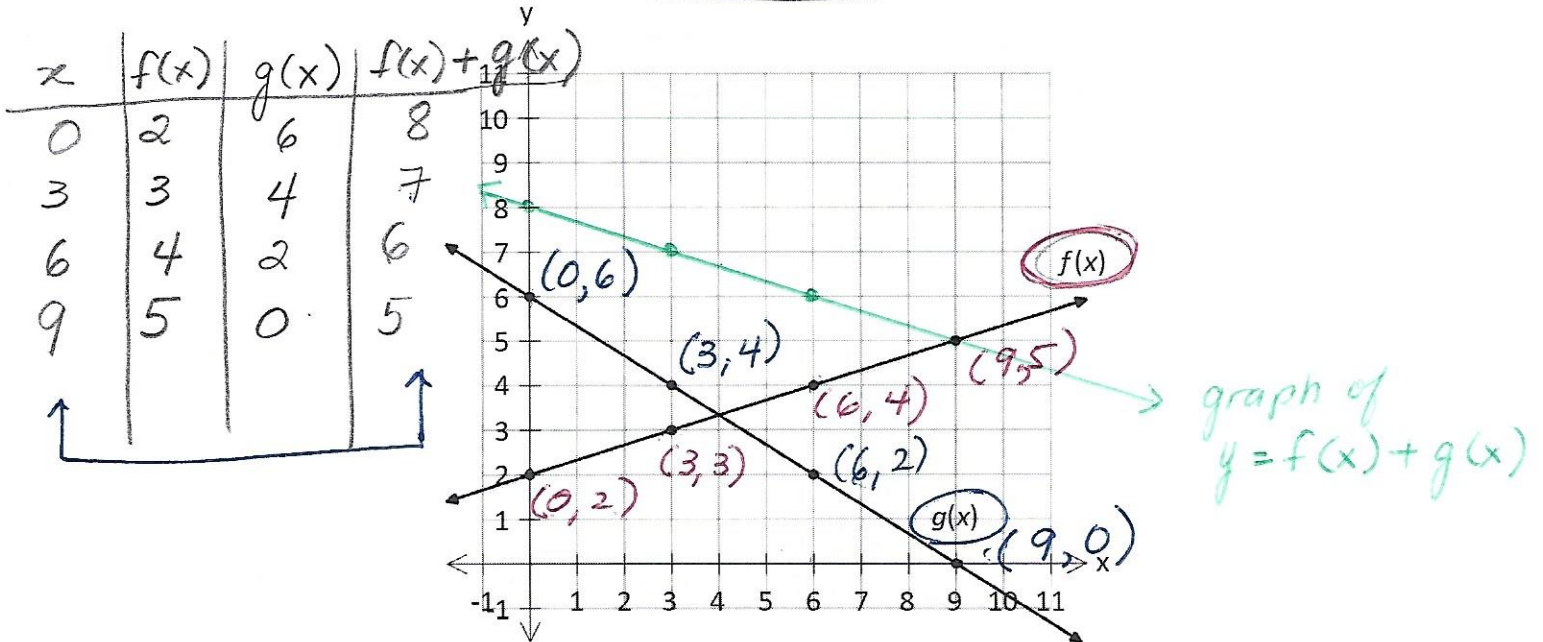
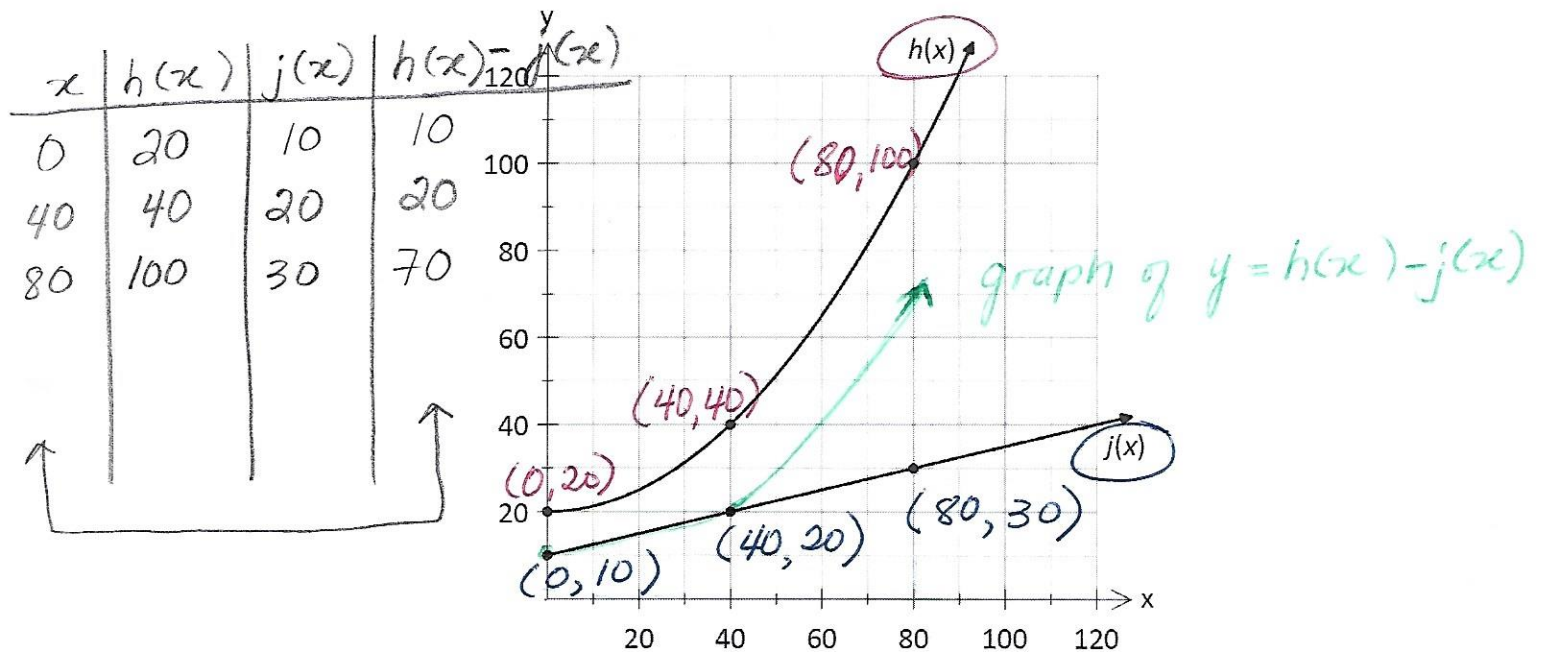


Lesson 1: Combining Functions Graphically

Example 1: The graphs of $f(x)$ and $g(x)$ are shown. On the same grid, sketch the graph of the sum of these two functions: $y = f(x) + g(x)$.

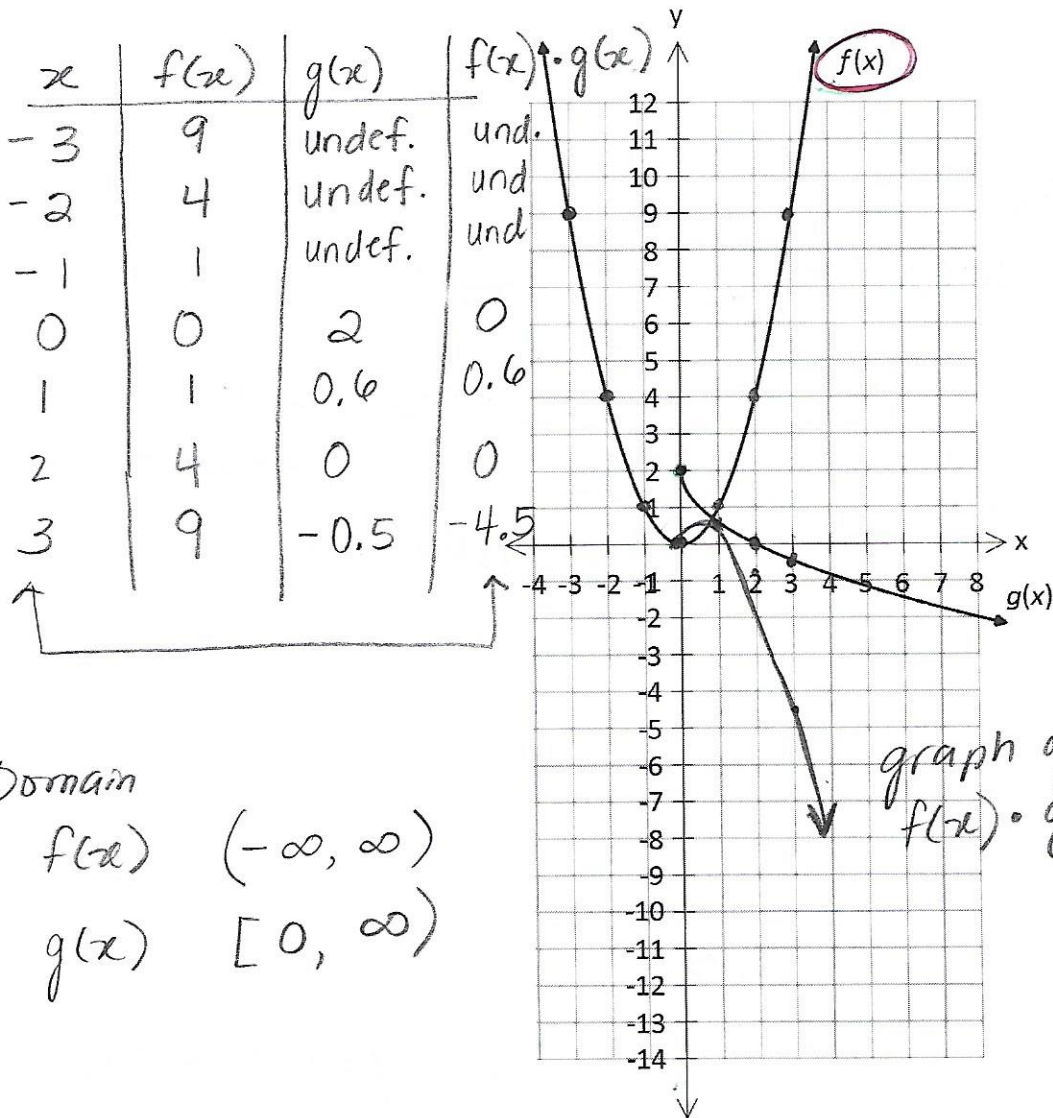


Example 2: The graphs of $h(x)$ and $j(x)$ are shown. On the same grid, sketch the graph of the difference of these two functions: $y = h(x) - j(x)$.



Example 3: The graphs of $f(x)$ and $g(x)$ are shown. On the same grid, sketch the graph of the product of these two functions: $y = f(x) \cdot g(x)$.

What are the domains of $f(x)$, $g(x)$, and $y = f(x) \cdot g(x)$?



Domain

$$f(x) \quad (-\infty, \infty)$$

$$g(x) \quad [0, \infty)$$

graph of
 $f(x) \cdot g(x)$

$$f(x) \quad \longleftarrow \text{---} \text{---} \text{---} \longrightarrow$$

0

$$g(x) \quad \longleftarrow \text{---} \text{---} \text{---} \longrightarrow$$

0

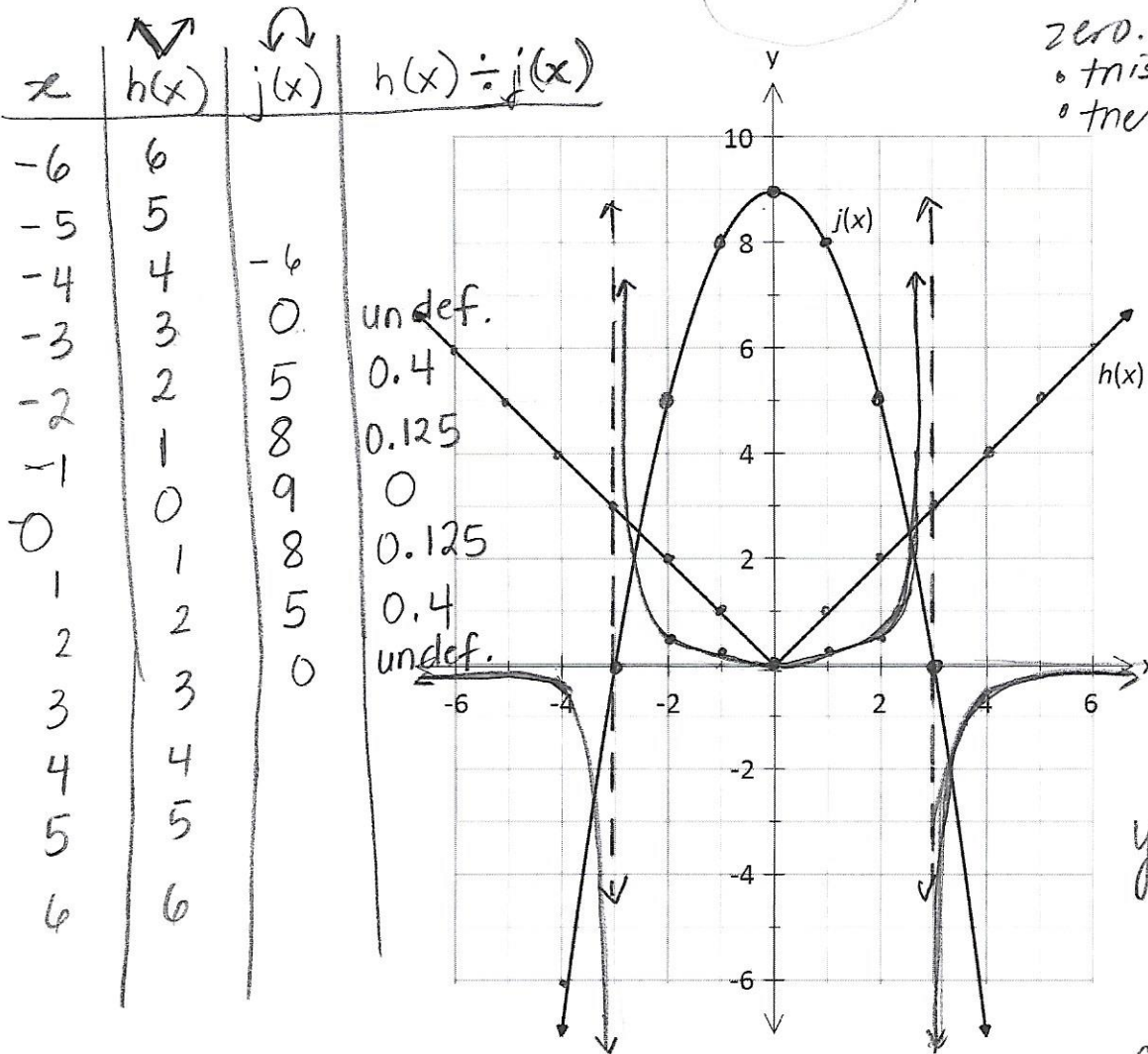
$$f(x) \cdot g(x) \quad \longleftarrow \text{---} \text{---} \text{---} \longrightarrow \quad \text{is } [0, \infty)$$

0

Example 4: The graphs of $h(x)$ and $j(x)$ are shown. On the same grid, sketch the graph of the quotient of these two functions: $y = \frac{h(x)}{j(x)}$.

What are the domains of $h(x)$, $j(x)$, and $y = \frac{h(x)}{j(x)}$?

denominator is zero.
 • this is npv.
 • there is an asymptote



$$y = \frac{|x|^3}{-x^2 + 9}$$

deg $p(x) < q(x)$
 horiz. asymp.
 is at $y=0$

$h(x): (-\infty, \infty)$
 $j(x): (-\infty, \infty)$

Domain of $\frac{h(x)}{j(x)}$ all values except when $j(x) = 0$. So where is $j'(x) = 0$? when $x = -3$ and 3

Assignment Time! Work on p.268- 1-3 Therefore Domain of $\frac{h(x)}{j(x)}$
 $(-\infty, -3) \cup (-3, 3) \cup (3, \infty)$
 or $x \in \mathbb{R}, x \neq \pm 3$.