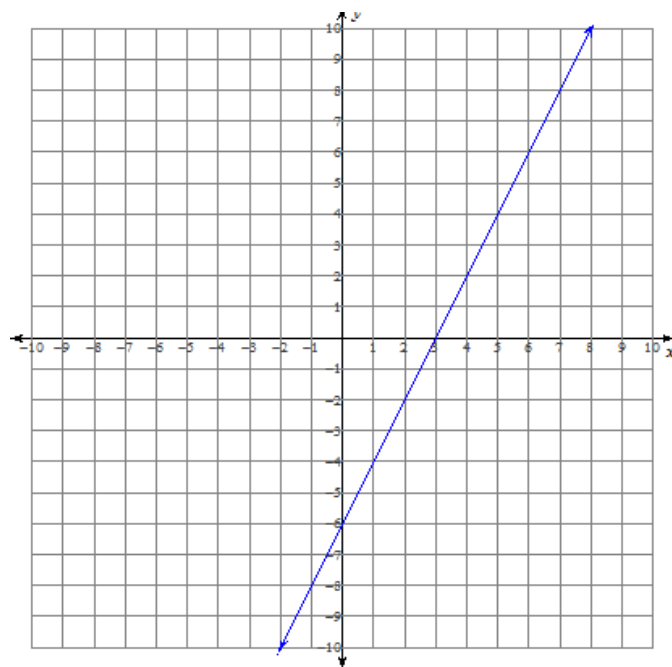


Function Toolkit #3 – Reciprocals, Inverses & Function Operations

1. Given the following graph of $f(x)$ sketch the graph of $y = \frac{1}{f(x)}$ showing all asymptotes, intercepts and invariant points. State the domain and range of the reciprocal function.

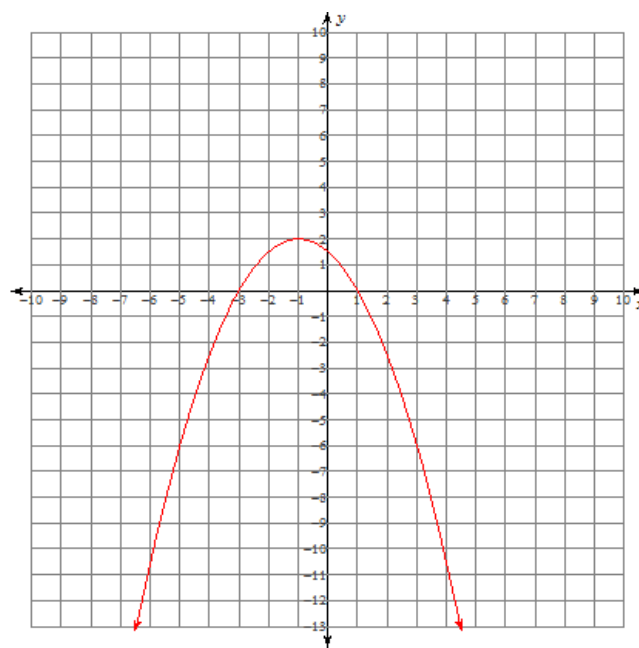
a)



Domain:

Range:

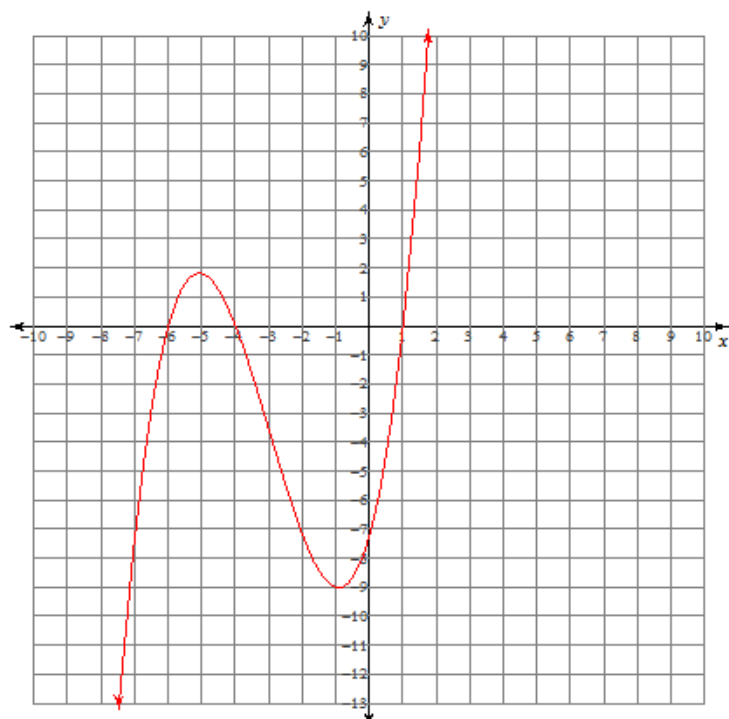
b)



Domain :

Range :

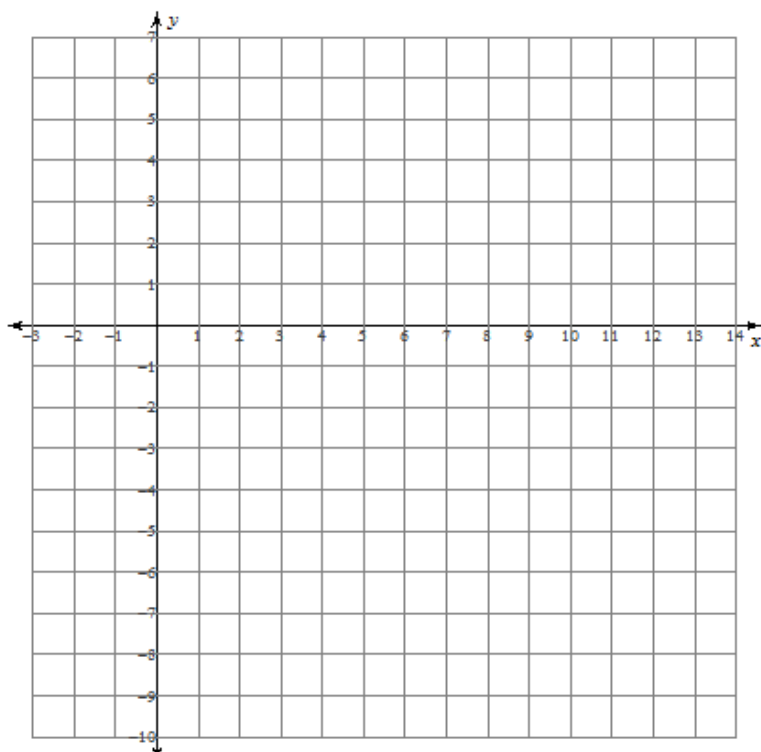
c)



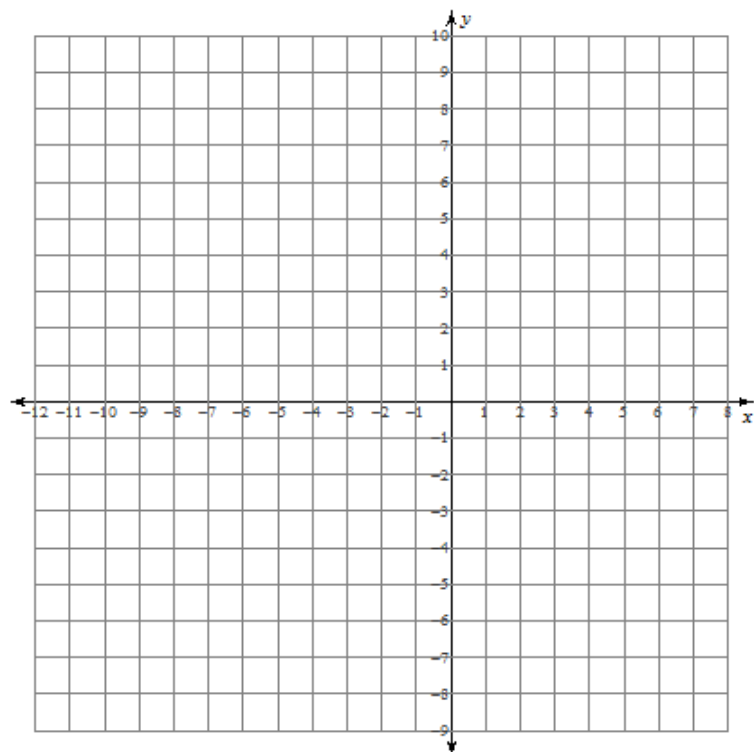
Domain:

Range:

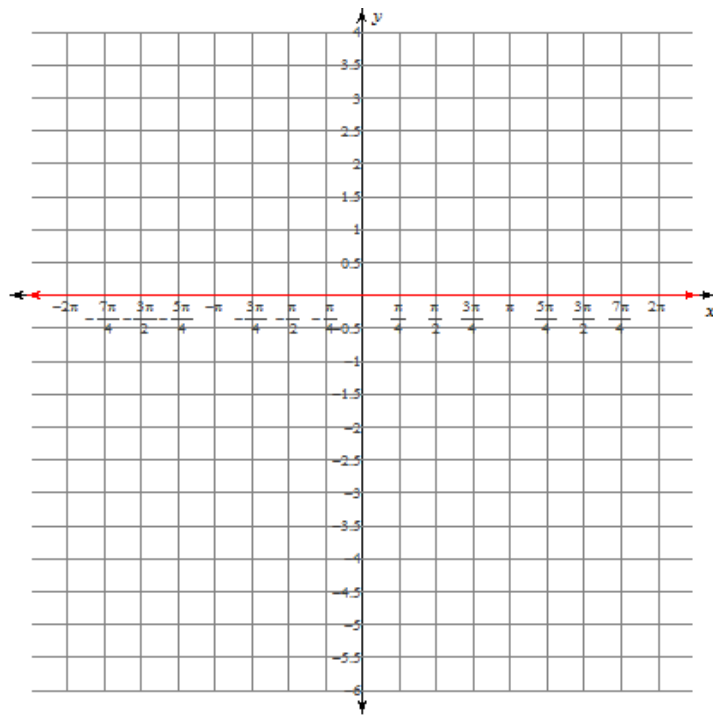
2. Given $f(x) = \log x$, sketch the graph of $y = \frac{1}{\log x}$.



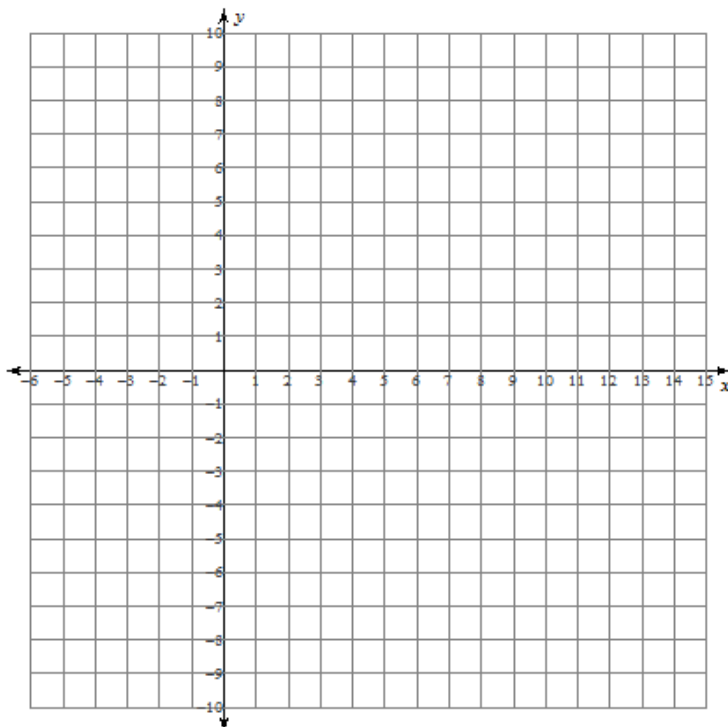
3. Given $f(x) = x^2 + 12x + 35$, sketch the graph of $y = \frac{1}{f(x)}$ showing all x- and y-intercepts and invariant points. State the domain and range of the reciprocal function.



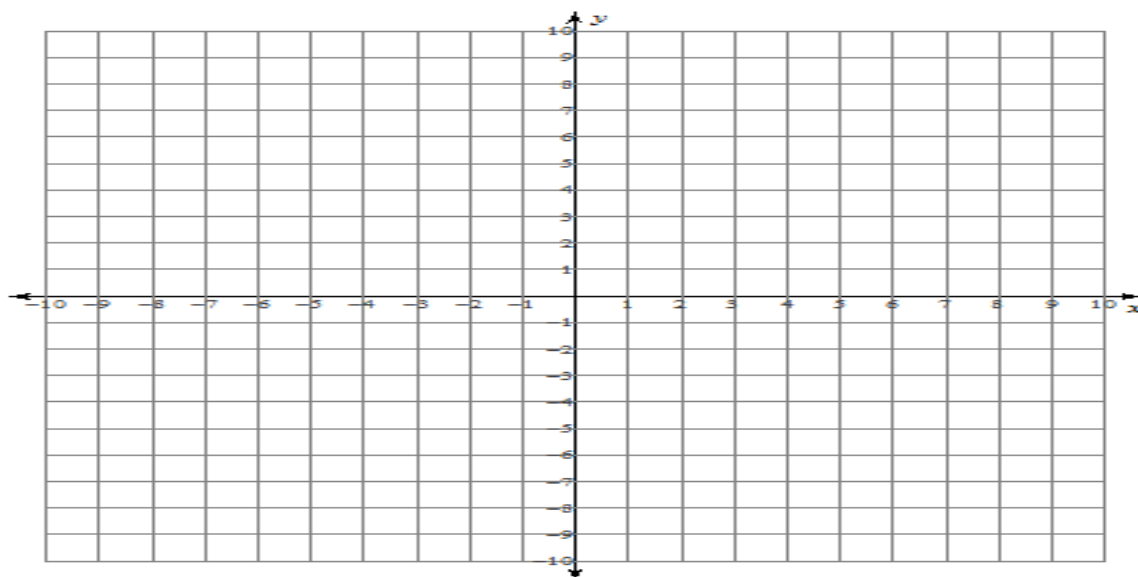
4. Given $f(x) = 3 \cos\left(2\left(x - \frac{\pi}{4}\right)\right)$, sketch the graph of $y = \frac{1}{f(x)}$ showing all x- and y-intercepts and invariant points. State the domain and range of the reciprocal function.



5. Given $f(x) = x^2 - 4, x \geq 0, x \in R$, sketch the graph of $y = f^{-1}(x)$ showing all x- and y-intercepts. State the equation, domain and range of the inverse function. Explain why the domain of the original function must be restricted so the inverse is a function.



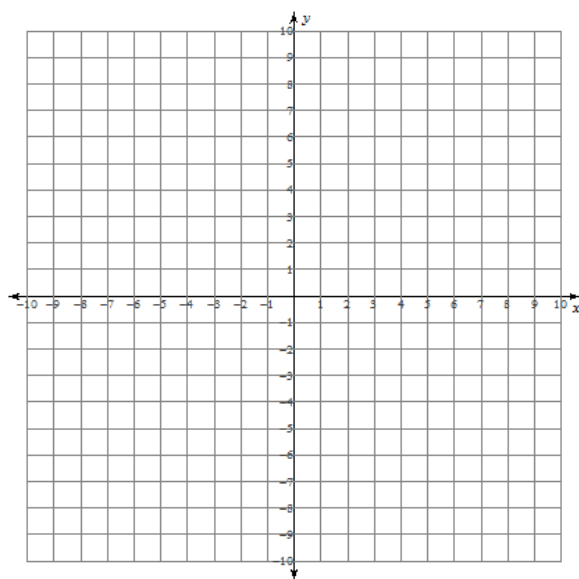
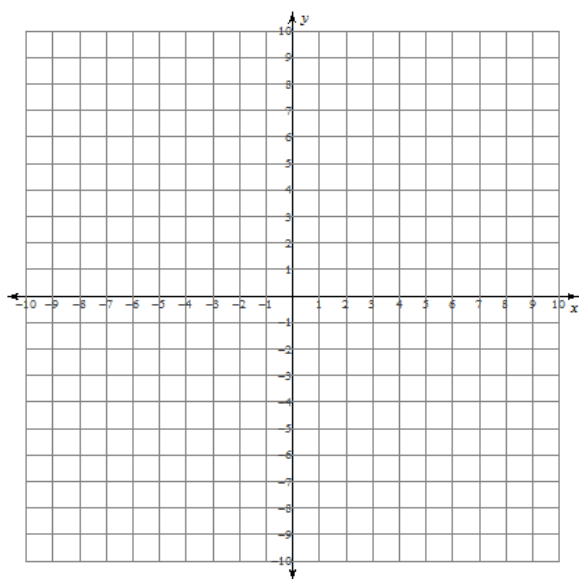
6. Given $f(x) = \log_2(x - 1)$, sketch the graph of $y = f^{-1}(x)$ showing all x- and y-intercepts. State the domain and range of the inverse function.



7. Given the graphs of $f(x) = x - 4$ and $g(x) = 2x$, sketch the following graphs.

a) $y = f(x) + g(x)$,

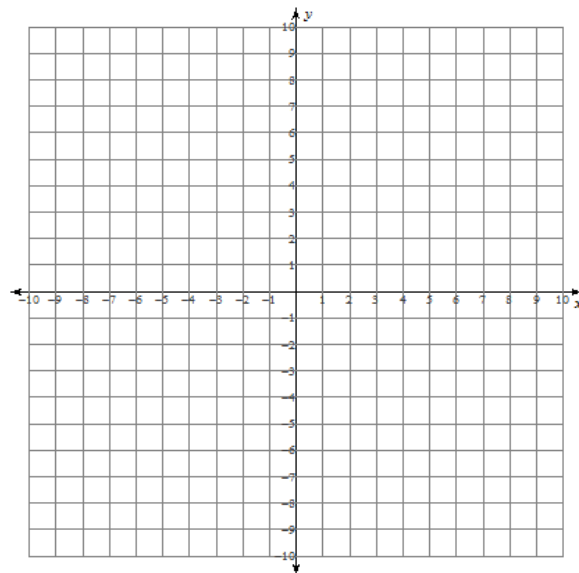
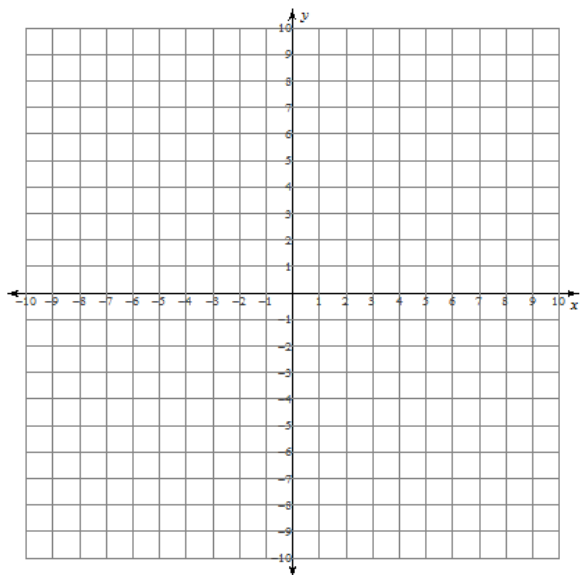
b) $y = \frac{f(x)}{g(x)}$.



8. Given the graphs of $f(x) = x^2$ and $g(x) = x - 2$, sketch the following graphs.

a) $y = f(x) - g(x)$

b) $y = f(x)g(x)$



9. Graph the function $y = x + \sqrt{x^2 - 4}$

