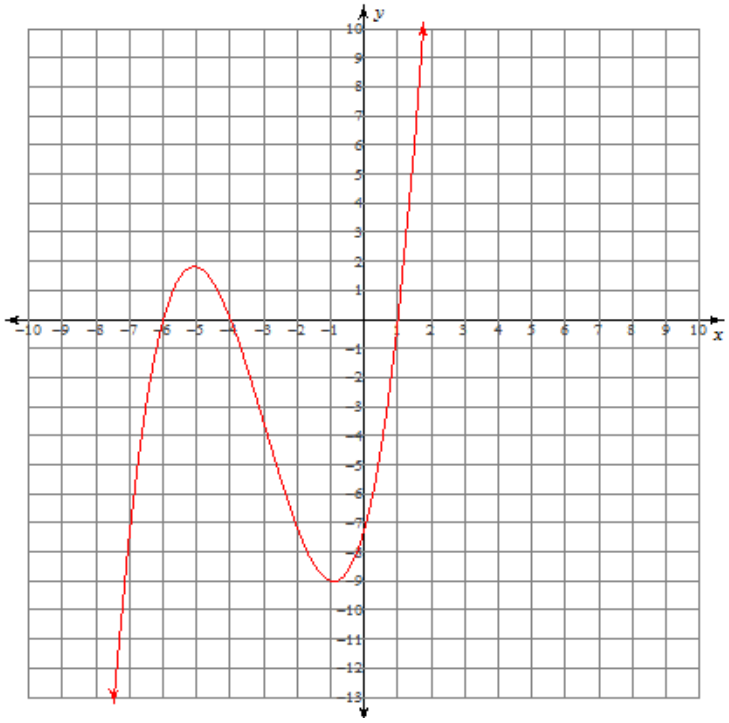
Function Toolkit #3 – Reciprocals, Inverses & Function Operations

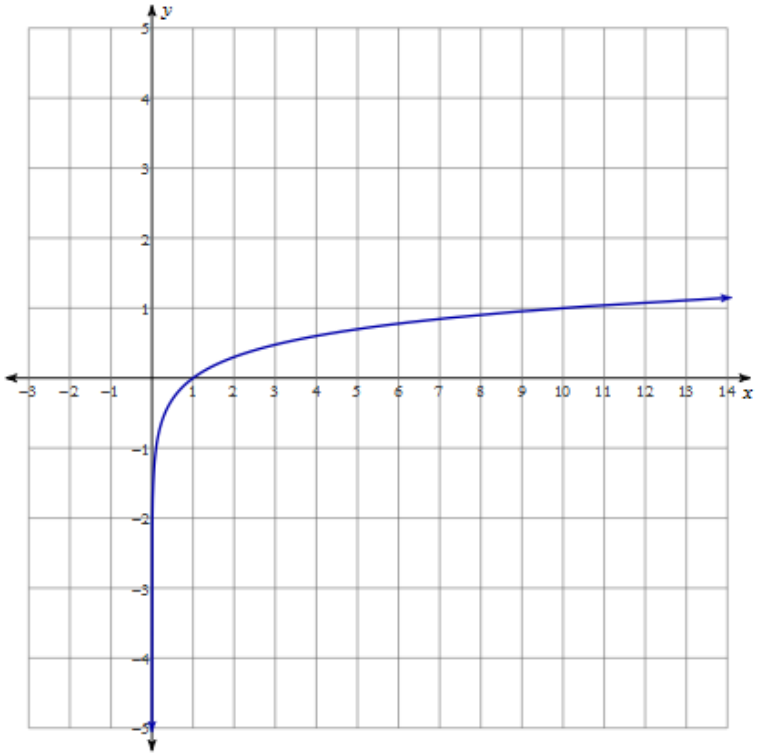
1. Given the following graph of $f(x)$, sketch the graph of $y = \frac{1}{f(x)}$ showing all asymptotes, intercepts and invariant points. State the domain and range of the reciprocal function.



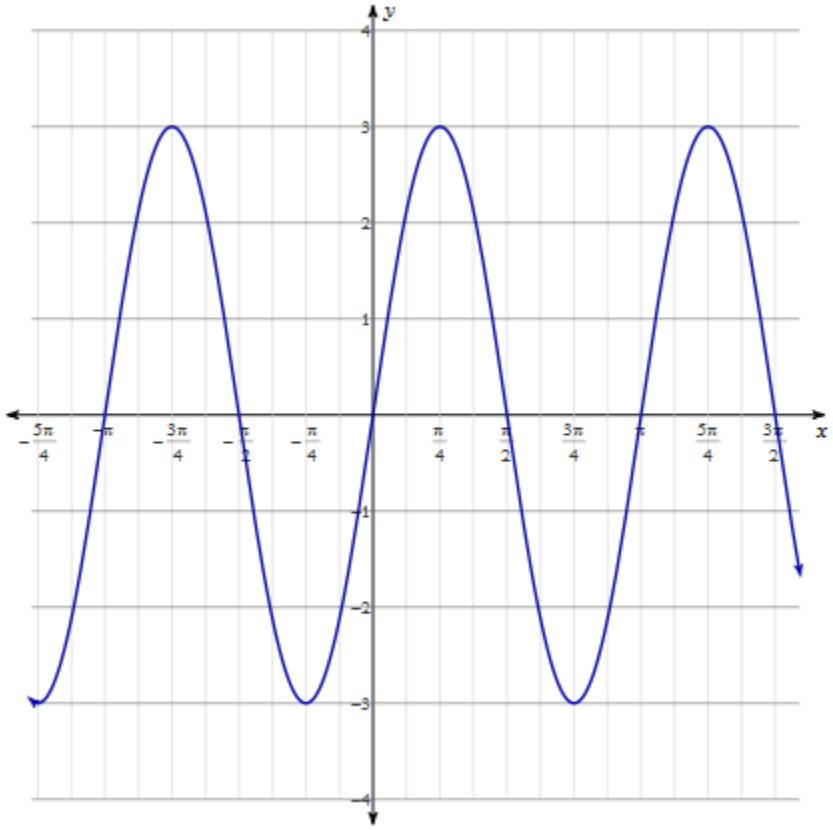
Domain: _____

Range: _____

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



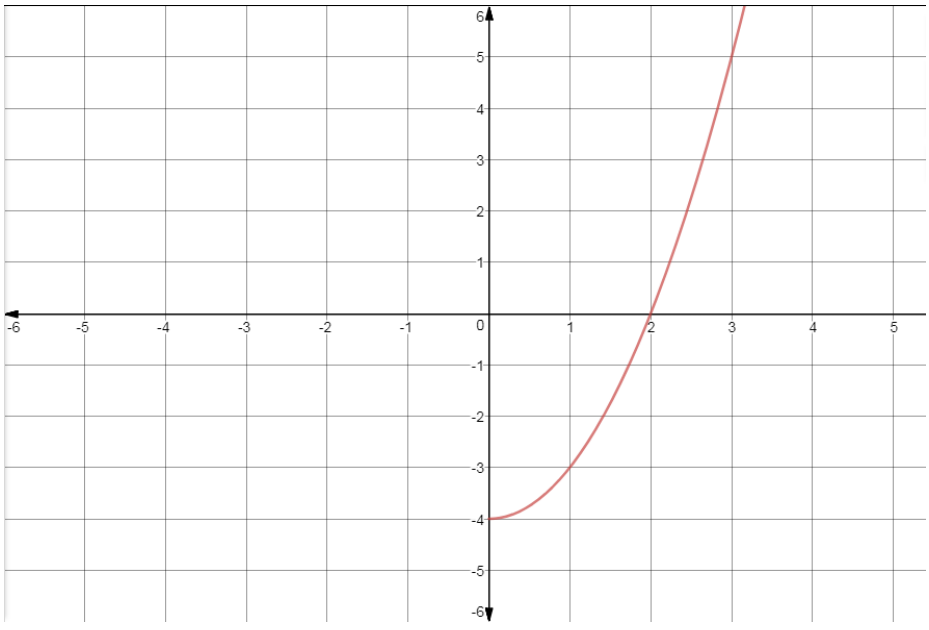
3. Given $f(x) = 3\cos\left(2\left(x - \frac{\pi}{4}\right)\right)$, sketch the graph of $y = \frac{1}{f(x)}$ showing all x- and y-intercepts and invariant points. State the domain and range of the reciprocal function.



Domain: _____

Range: _____

4. Given $f(x) = x^2 - 4, x \geq 0, x \in R$, sketch the graph of $y = f^{-1}(x)$. 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.

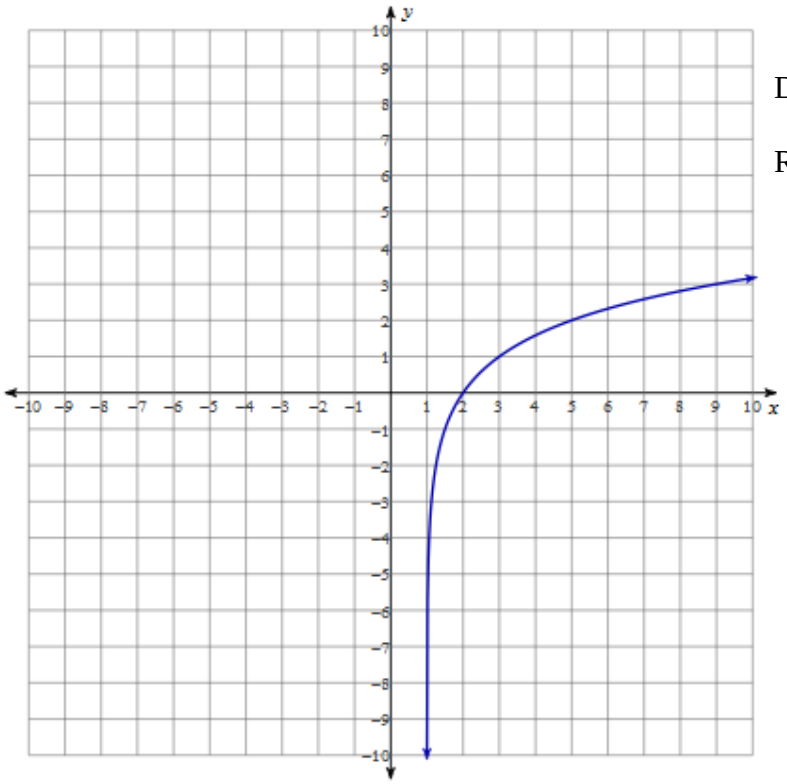


Equation: _____

Domain: _____

Range: _____

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

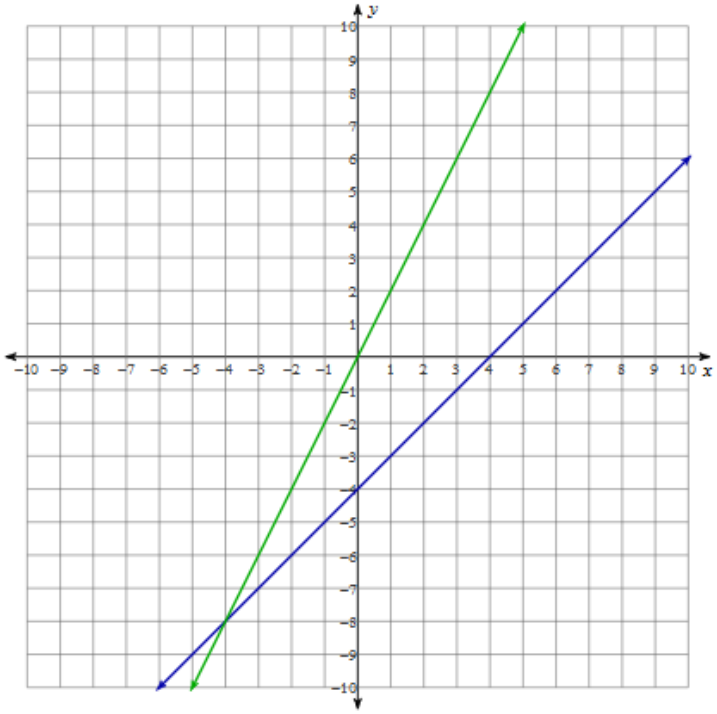


Domain: _____

Range: _____

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

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



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