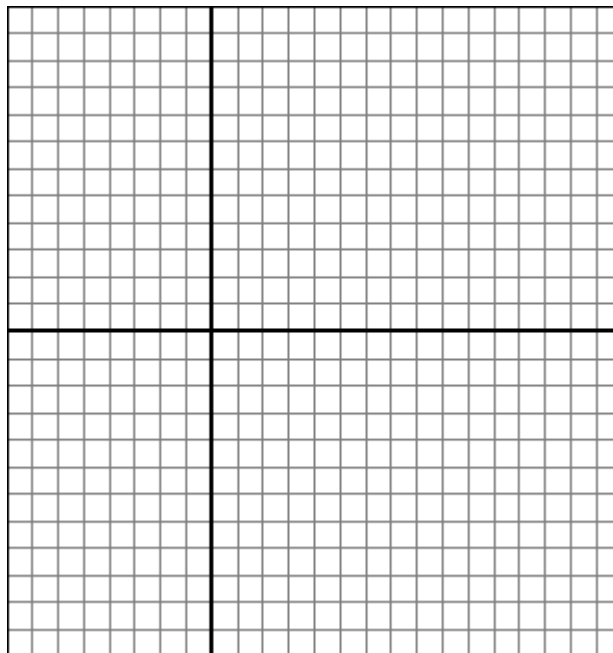


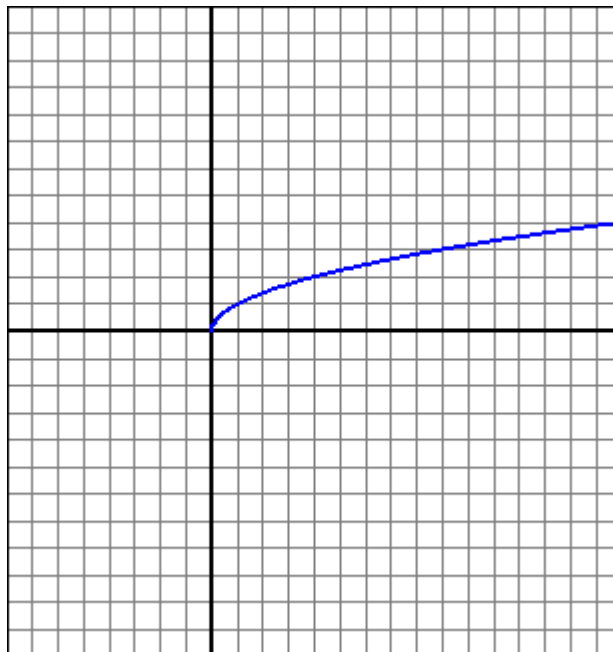
Precalculus 115, section 2.6 Transformations of Graphs

notes by Tim Pilachowski

Example A: Sketch the graph of $f(x) = \sqrt{x}$.



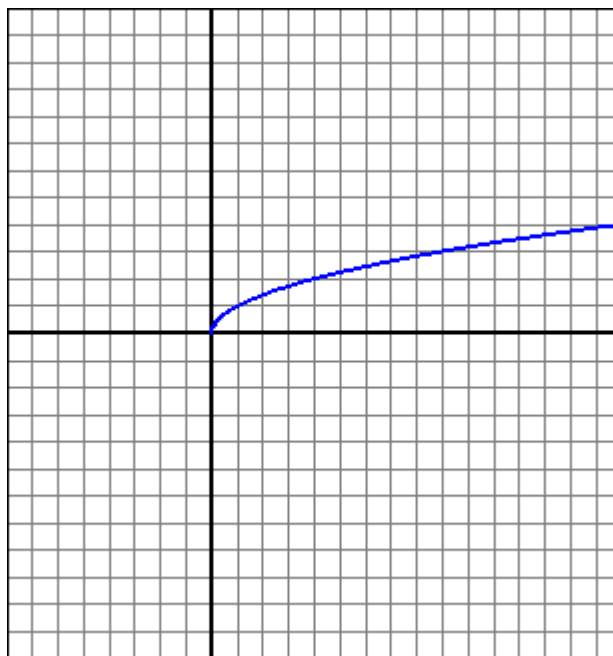
Example B: Compare the graph of $g(x) = \sqrt{x} + 3$ to the graph of $f(x) = \sqrt{x}$.



How would the graph of $f(x) = \sqrt{x}$ be shifted to obtain the graph of $y = \sqrt{x} + 10$?

How would the graph of $f(x) = \sqrt{x}$ be shifted to obtain the graph of $y = \sqrt{x} - 10$?

Example C: Compare the graph of $h(x) = \sqrt{x+3}$ to the graph of $f(x) = \sqrt{x}$.



How would the graph of $f(x) = \sqrt{x}$ be shifted to obtain the graph of $y = \sqrt{x+10}$?

How would the graph of $f(x) = \sqrt{x}$ be shifted to obtain the graph of $y = \sqrt{x-10}$?

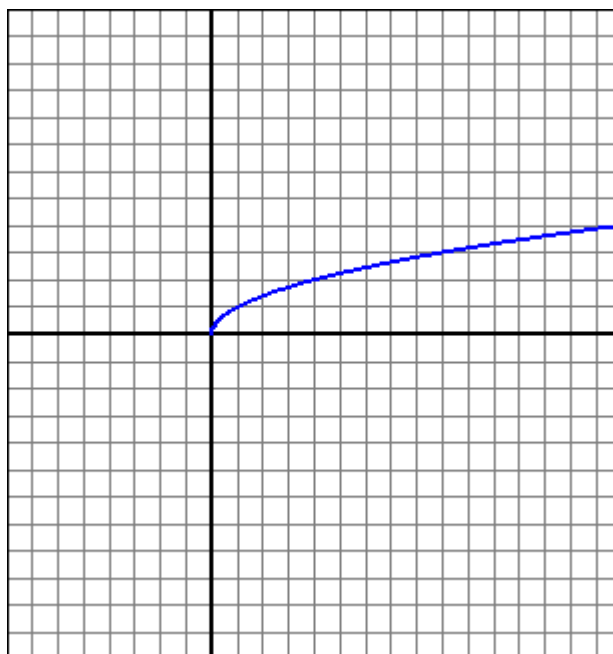
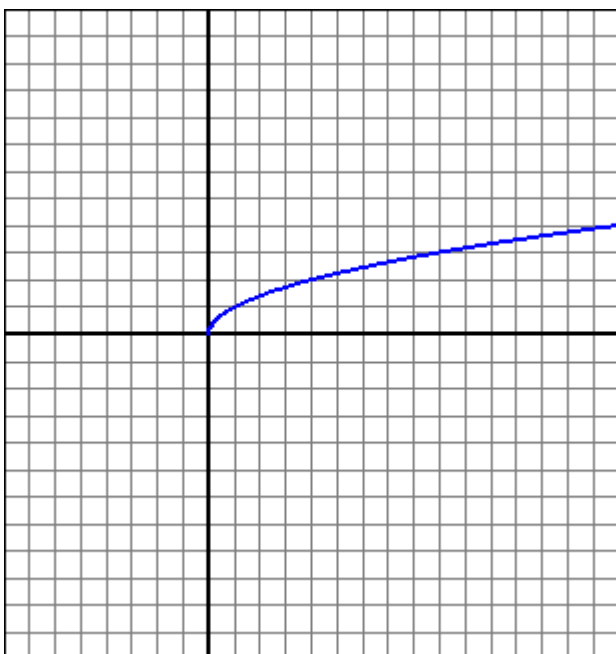
Example D: Compare the graph of $m(x) = -\sqrt{x}$ and $n(x) = \sqrt{-x}$ to the graph of $f(x) = \sqrt{x}$.

Important questions: What is the domain of $m(x)$?

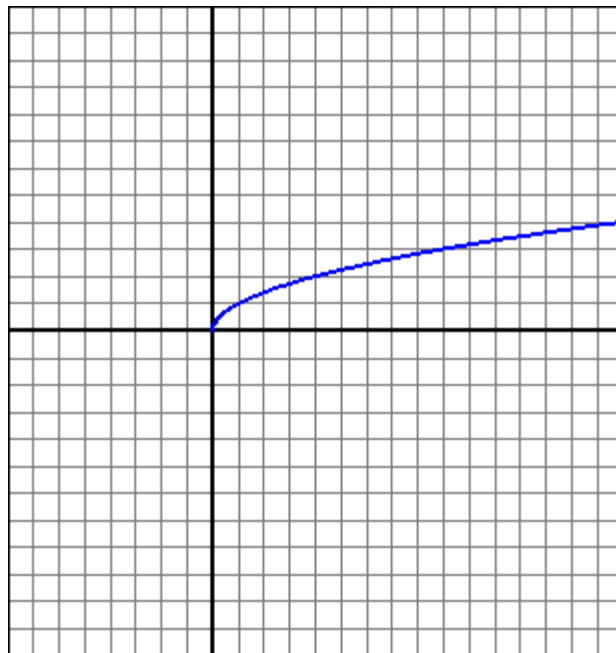
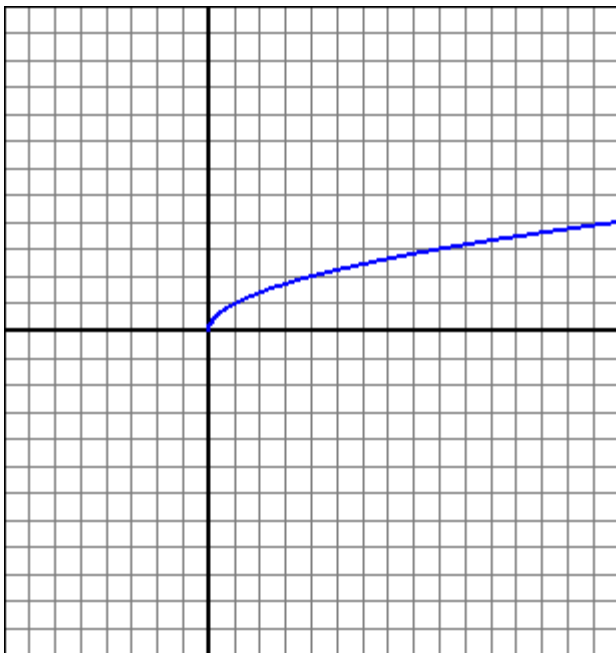
What is the range of $m(x)$?

What is the domain of $n(x)$?

What is the range of $n(x)$?



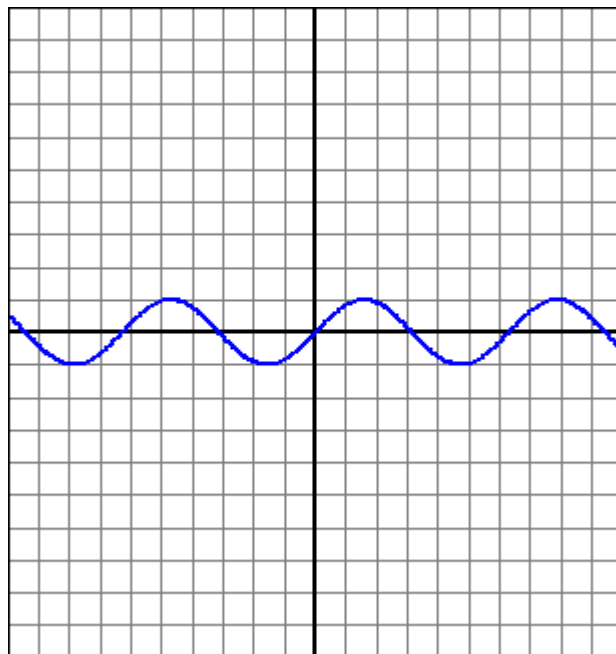
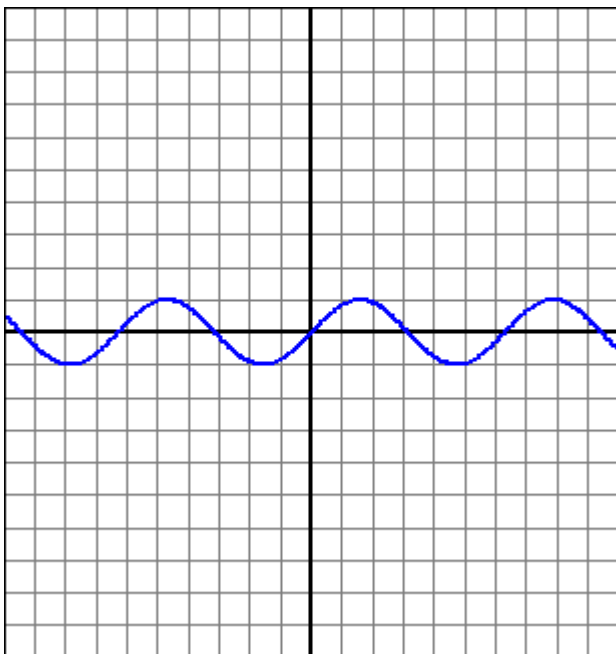
Example E: Compare the graphs of $p(x) = 3\sqrt{x}$ and $q(x) = \frac{1}{3}\sqrt{x}$ to the graph of $f(x) = \sqrt{x}$.



How would the graph of $f(x) = \sqrt{x}$ be shifted to obtain the graph of $y = 10\sqrt{x}$?

How would the graph of $f(x) = \sqrt{x}$ be shifted to obtain the graph of $y = \frac{1}{10}\sqrt{x}$?

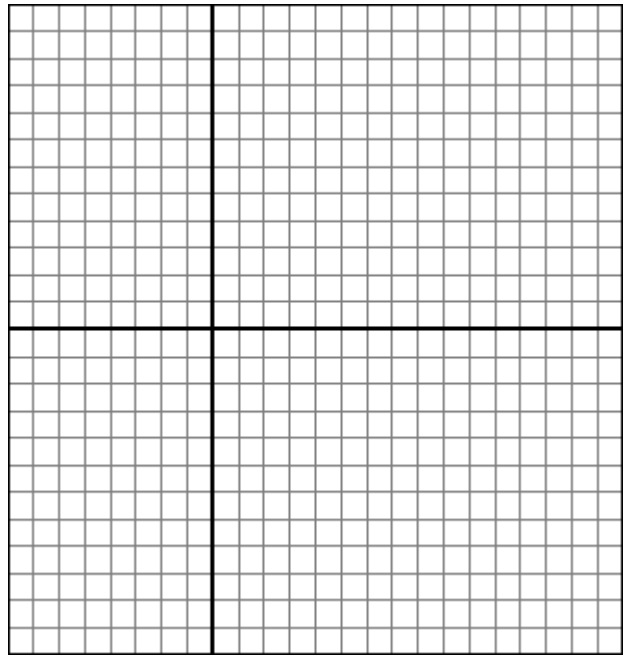
Example F: Compare the graphs of $g(x) = \sin(3x)$ and $h(x) = \sin\left(\frac{1}{3}x\right)$ to the graph of $f(x) = \sin x$.



How would the graph of $f(x) = \sin x$ be shifted to obtain the graph of $y = \sin(10x)$?

How would the graph of $f(x) = \sin x$ be shifted to obtain the graph of $y = \sin\left(\frac{1}{10}x\right)$?

Example G: Sketch the graph of $f(x) = -2\sqrt{x+4} + 6$.



Summary:

- Move the reference point (reflection, stretch/shrink, left/right, up/down).
- Find all intercepts.
- Connect the dots and label all important points.

Basic graphs you need to know for this section:

