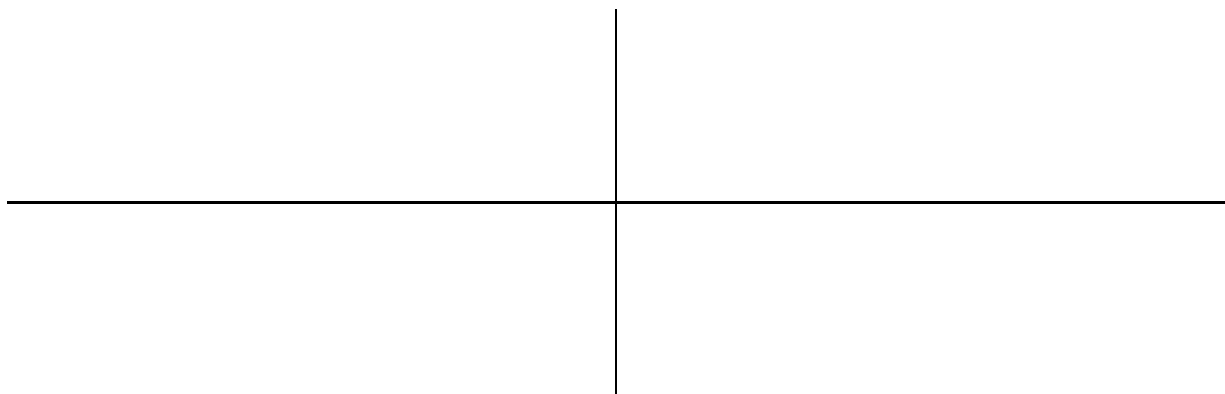


Section 7.8 Worksheet:

Assigned problems: Exercises pp. 397-399, #1, 2, 6, 10, 17, 18, 21, 50, 57, 83, 84

1. Draw $\sin(x)$ and $\tan(x)$ on the intervals containing 0 for which they are one-to-one. Use the “magic mirror” (along the line $y = x$) to draw in the inverse functions ($\sin^{-1}(x)$ and $\tan^{-1}(x)$).

2. Graph the function $\frac{e^x}{1+e^x}$, and comment on the similarity to $\tan^{-1}(x)$. Both are called “sigmoidal functions”, because they look like stretched and elongated “S”es.



3. The derivatives of the inverse trig functions open up new classes of functions that we can now integrate. For example, there was previously no way to analytically solve the integral

$$\int \frac{dx}{x^2 + 1}$$

What would you write now?

Notes:

1. There's risk of killing you with notation: be careful! By $\sin^{-1}(x)$ here we mean $\arcsin(x)$, not $1/\sin(x)$. Very bad of us!
2. Inverse trig functions that I've known and loved: the two that I've used with any regularity are the arcsine and arctangent functions. Know those well: graphically, domains, ranges, derivatives, etc.