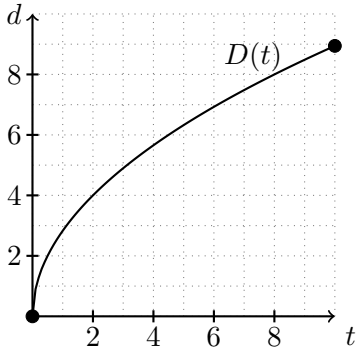
8. [5 points] Let $y = q(x) = \frac{ax}{1+ax}$, where $a > 0$ is a positive constant. Find a formula for the function $q^{-1}(y)$, showing **all** your work.

$q^{-1}(y) =$ _____.

9. [5 points] Consider the function $D(t)$ with its graph shown below on the left, and the piecewise-defined function $S(d)$.



$$S(d) = \begin{cases} 0 & d < 0 \\ -d^2 - 10d + 100 & 0 \le d \le 10 \\ 0 & d > 10 \end{cases}$$

a. [1 point] Is $S(D(t))$ invertible?

yes no not possible to tell

b. [4 points] Find all solutions t to the equation $S(D(t)) = 25$. Be sure to show **all** your work and, if necessary, estimate any coordinates on the graph of $D(t)$ to one decimal place.

$t =$_____.