Functions and inverse functions

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12:23

A function is a rule or "map" assigning an output value to an input value. The set (meaning the group) of input values is the domain, while the set of output values is the range.
General notation:

$f(x)$ = some expression (usually) involving x

Examples:

$f(x) = 2$ constant, all outputs are 2, no matter what input.

$f(x) = x^2 + 4$

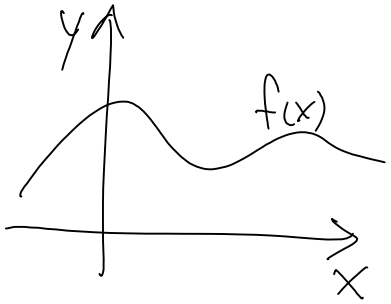
$f(x) = mx + b$

we call m and b parameters, and treat them like fixed numbers.

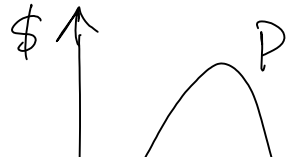
Graph of a function

plot $y = f(x)$

"y as a function of x"

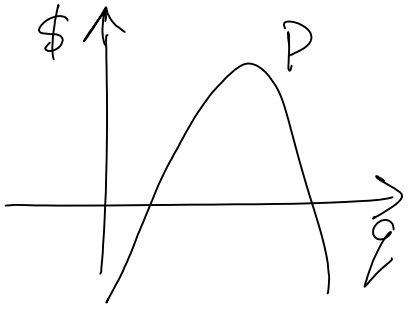


plot profit $P(q)$



plot profit $P(q)$

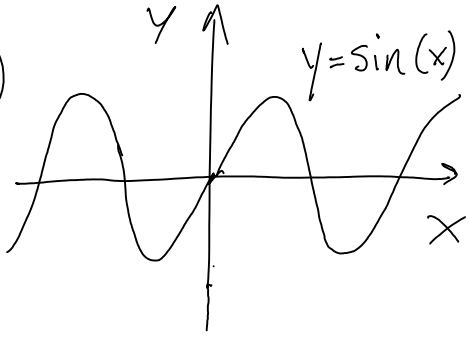
"P as a function of q"



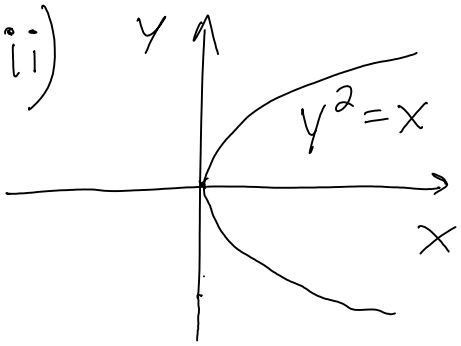
To be the graph of a function, the graph must satisfy the line test.

Which of these is the graph of a function? Why or why not?

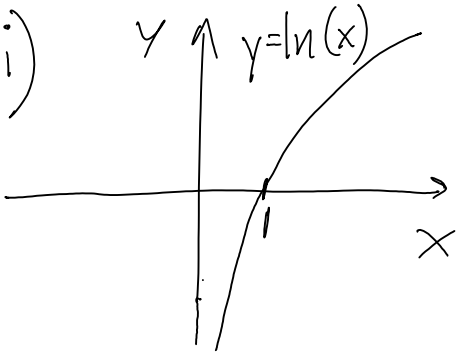
i)



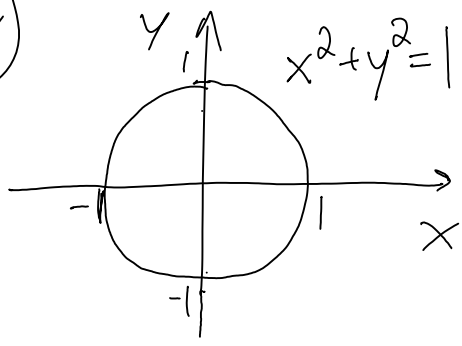
ii)



iii)



iv)



All of these are graphs in the xy plane, but

Graph of a 1-1 ("one-to-one") function must satisfy the _____ line test.

Which of the above are graphs of 1-1 functions?

How are the two line tests and inverse functions related?

Our favourite inverse functions in Math 104:

e^x and $\ln(x)$	p and q
We "need" $\ln(x)$ to solve equations like:	It is useful to switch between dependence on price and demand

$3 = e^{t/12}$ for t

and dependence on quantity

Related by the

Example: $p = -\frac{1}{50}q + 300$

This is "p written as a function of q". Can we "invert it to have q written as a function of p?