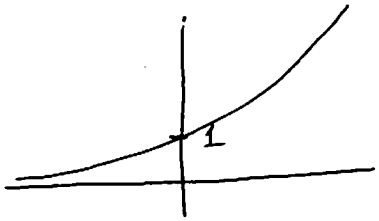
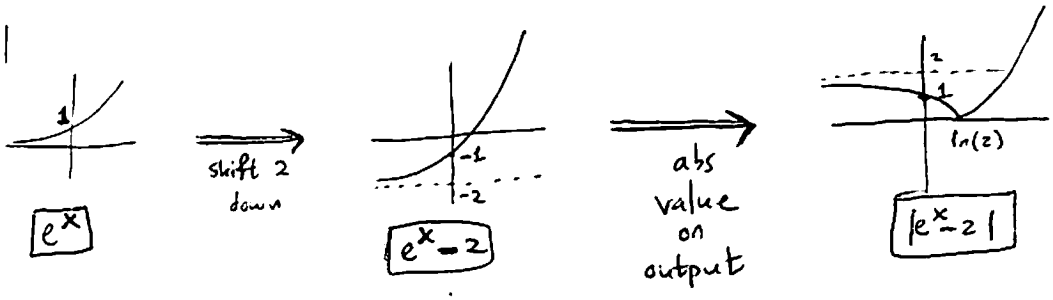
MATH 112: **Quiz 2** Sec 1.3 and 1.5 04/12/2019 NAME:

(1) Give sketches the graphs of each of the following functions. Clearly indicate x and y intercepets on your sketch

(a) e^x

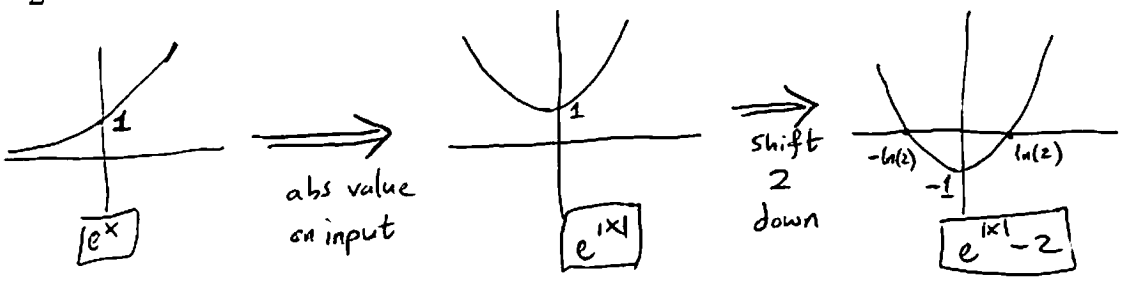


(b) $|e^x - 2|$



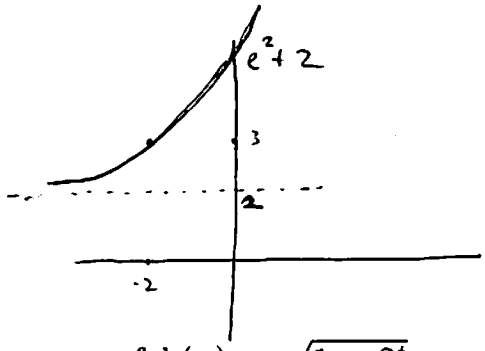
To find x-intercept, solve $|e^x - 2| = 0$

(c) $e^{|x|} - 2$

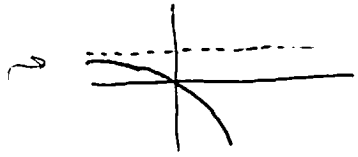


(d) $e^{(x+2)} + 2$

shift left 2 and shift up 2.



(2) Determine the domain and range of $h(x) = \sqrt{1 - 2^t}$



Domain:

must have

$1 - 2^t \geq 0$

$1 \geq 2^t$

$\ln(1) \geq \ln(2^t)$

$0 \geq t \ln(2)$

$0 \geq t$

so $(-\infty, 0]$

can also see this from graph of $1 - 2^t$

Range:

since $t \leq 0$,

$0 < 2^t \leq 2^0 = 1$

$0 > -2^t \geq -1$

$1 > 1 - 2^t \geq 0$

$\sqrt{1} > \sqrt{1 - 2^t} \geq 0$

so $[0, 1)$

can also see from graph

MATH 112: **Quiz 3** Sec 1.6 and 1.7 04/22/2019 NAME:

(1) Given

$$f(x) = \ln(2 + \ln(x)).$$

(a) Find domain of f.

must have $x > 0$ and $2 + \ln(x) > 0$

$2 + \ln(x) > 0$

$\Rightarrow \ln(x) > -2$

$\Rightarrow e^{\ln(x)} > e^{-2}$

$\Rightarrow x > e^{-2}$

so $x > 0$ and $x > e^{-2}$, that is $x > e^{-2}$

Domain: (e^{-2}, ∞)

(b) Find its inverse function f^{-1}.

$y = \ln(2 + \ln(x))$

$x = \ln(2 + \ln(y))$

$e^x = e^{\ln(2 + \ln(y))}$

$e^x = 2 + \ln(y)$

$e^x - 2 = \ln(y)$

$e^{e^x - 2} = e^{\ln(y)}$

$e^{e^x - 2} = y$ so $f^{-1}(x) = e^{e^x - 2}$

(c) Find the range of f (the original function).

Range of f = domain of f^{-1} = $\mathbb{R}$

domain is all real numbers.

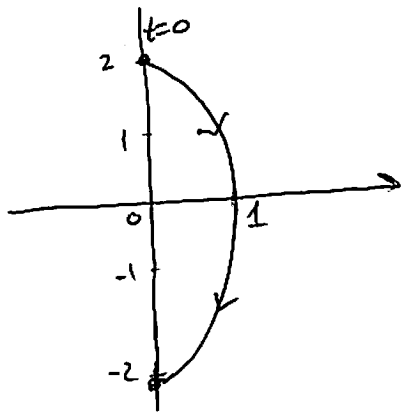
There's a question on the other side.

(2) Keeping in mind that you know $x = \cos(t)$, $y = \sin(t)$ would parametrize a unit circle drawn counterclockwise, give a careful sketch of the curve parametrized by

$$x = \sin(t) \qquad y = 2\cos(t) \qquad 0 \le t \le \pi.$$

Indicate the location of the point corresponding to $t = 0$ and arrows showing the direction of the curve.

t	x	y
0	0	2
$\pi/4$	$\sqrt{2}/2$	$\sqrt{2}$
$\pi/2$	1	0
$3\pi/4$	$\sqrt{2}/2$	$-\sqrt{2}$
π	0	-2



also, comparing to $x=\cos(t)$, $y=\sin(t)$ we have:

- cos & sin switched
- $\times 2$ on y
- only have $0 \le t \le \pi$, not $0 \le t \le 2\pi$