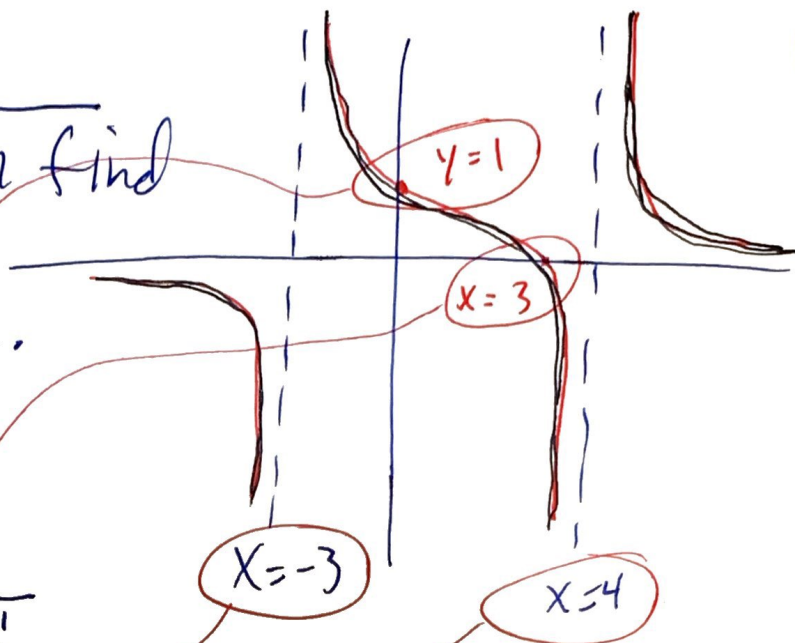


3.7 Extension (Notes)

Given the graph find
#57 of text
the equation.



Form: $f(x) = a \frac{(x-3)}{(x+3)(x-4)}$

Point: $f(0) = a \frac{(-3)}{(0+3)(0-4)} = a \frac{-3}{-12} = \frac{a}{4}$

Solves: $1 = \frac{a}{4}$

so $a = 4$

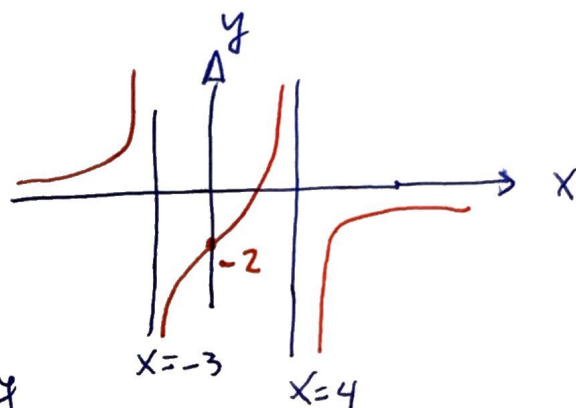
Final:

$$f(x) = \frac{4(x-3)}{(x+3)(x-4)}$$

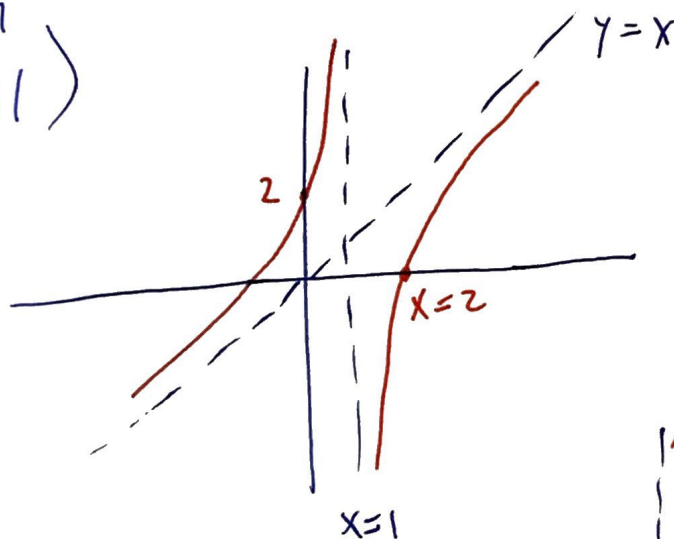
#3. Sketch $f(x) = \frac{(x+2)^2 (x-5)}{x^3 + 2x^2 - 11x - 12}$

#4. (Text 3.7 # 58)

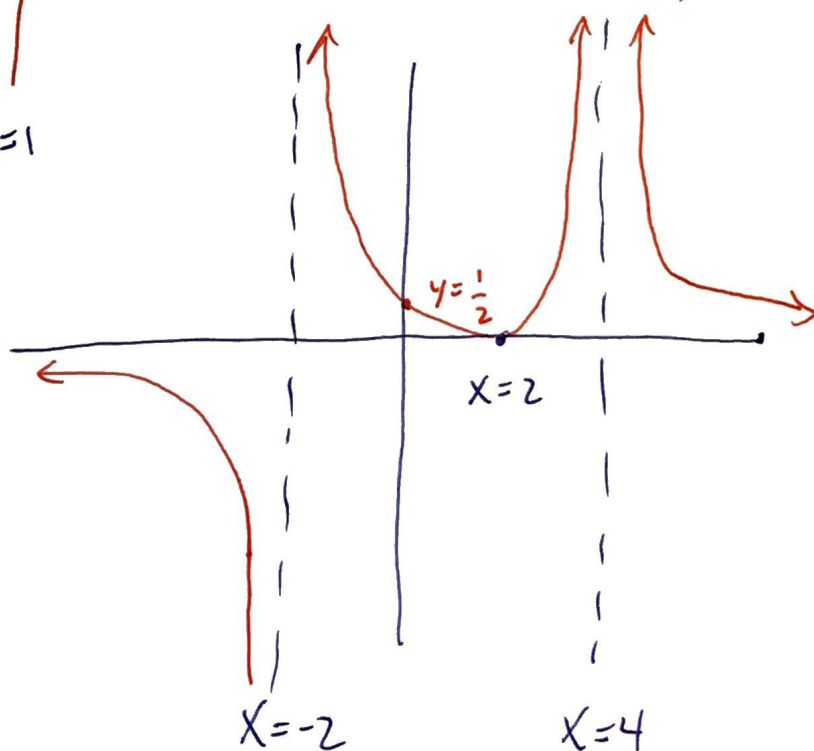
* write the rational function belonging to this graph.



#5. (3.7 #61)



#6. (3.7 #64)

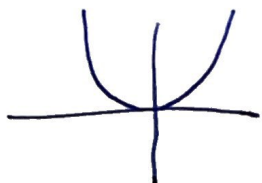


Chapter 4 Exponential & Logs

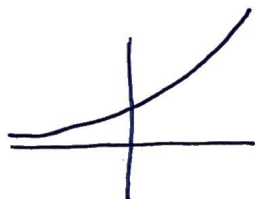
mymathmantra.com (2)
math 070
Summer 2021
chpt 4 notes

4.1 Exponential Function

power function: $f(x) = x^2$ { the base is a variable
the exponent is a constant.



exp. function: $f(x) = 2^x$ { base is a constant
exponent is a variable



By examining data we can check to see how a function behaves

x	1	2	3	4
f	70	40	10	-20

$\Delta x = 1$ $\Delta x = 1$
 $\Delta y = -30$ $\Delta y = -30$

x	1	2	3	4
f	10	20	40	80

$\Delta x = 1$ $\Delta x = 1$ $\Delta x = 1$
 $\Delta y = 10$ $\Delta y = 20$ $\Delta y = 40$

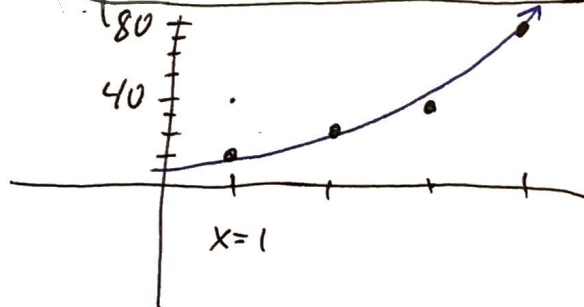
Δy doubles
so 2^x

$$y = CA^x \quad (5 \cdot 2^x)$$

linear ratio = slope

$$m = \frac{\Delta y}{\Delta x} = \frac{-30}{1} = \boxed{-30}$$

$y = 10x^2$ won't work



(3)

* growth

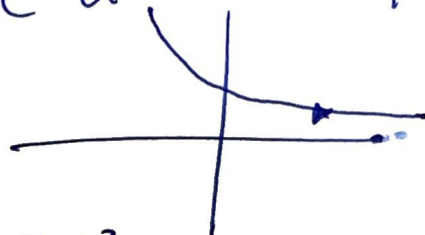
$$f(x) = c \cdot a^x$$

* decay

$$f(x) = c \cdot a^{-x}$$

← (+) exp.

← (-)



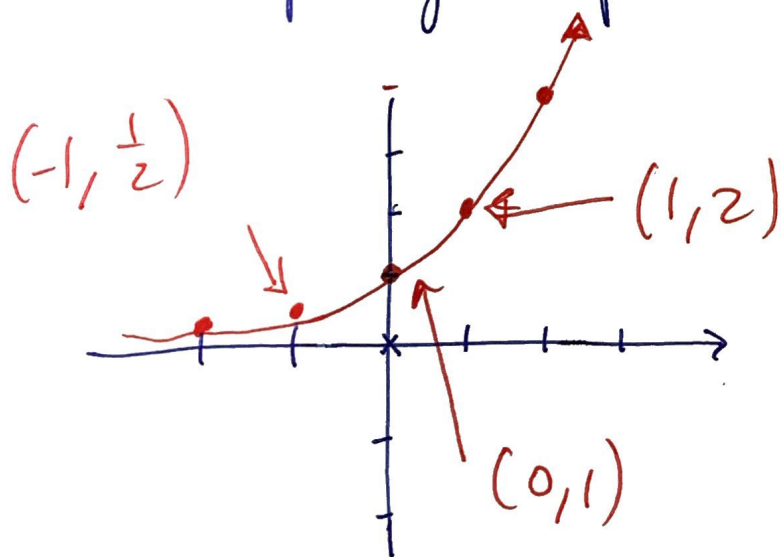
EX. Is $f(x) = 4^{2x+3}$ growth or decay?

Is $f(x) = 2.25 e^{-2t}$ decay

Is $y = 150 e^{3.25/t} = 150 e^{3.25 t^{-1}}$ neither

← power of exponent is not 1

4.2 Graphing exponential function

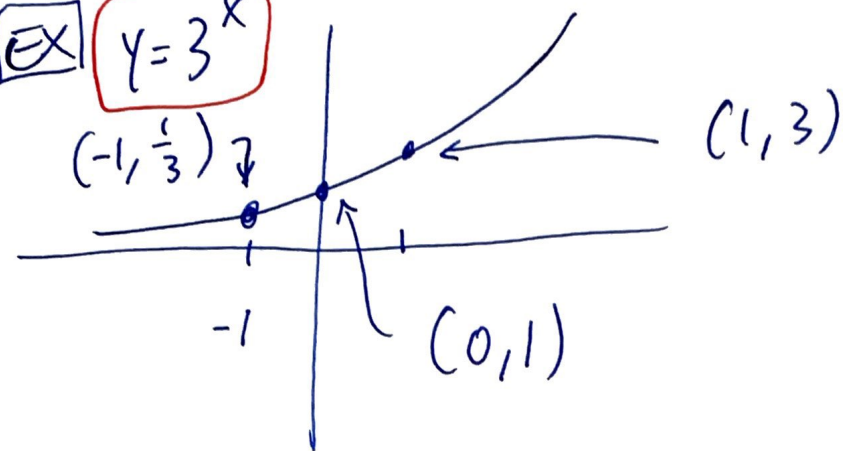


$$y = 2^x$$

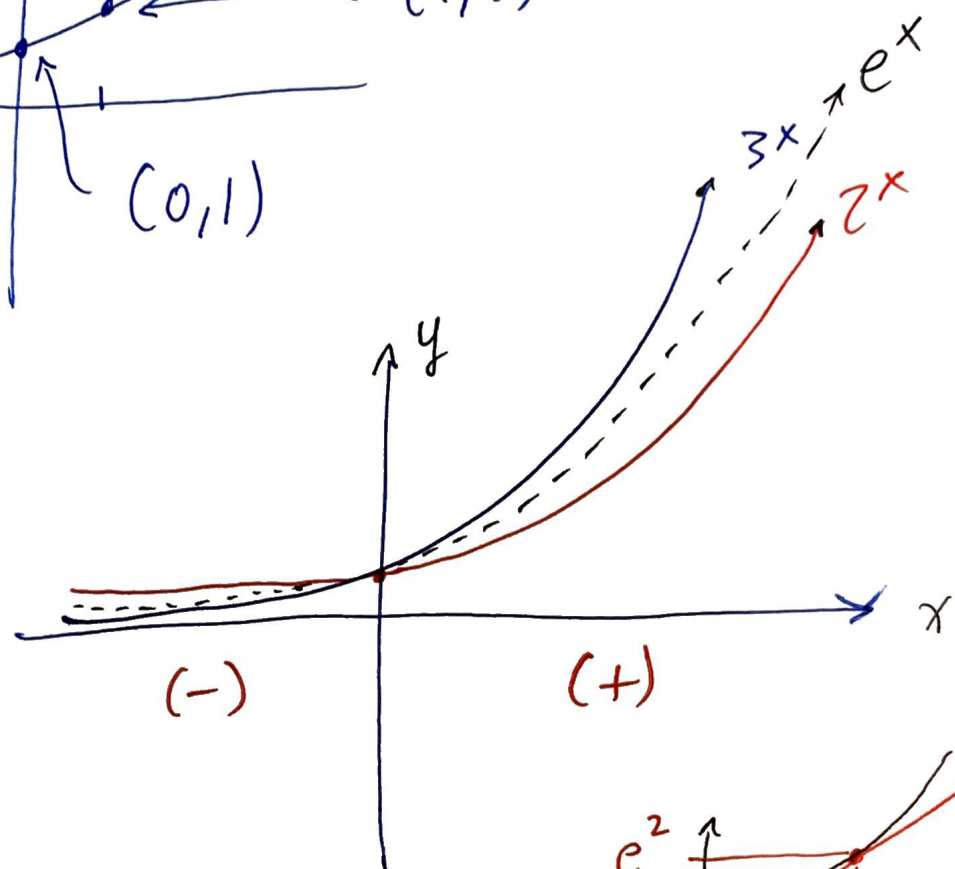
x	y
-2	$2^{-2} = 1/4$
-1	$2^{-1} = 1/2$
0	$2^0 = 1$
1	$2^1 = 2$
2	$2^2 = 4$

(4)

EX $y = 3^x$



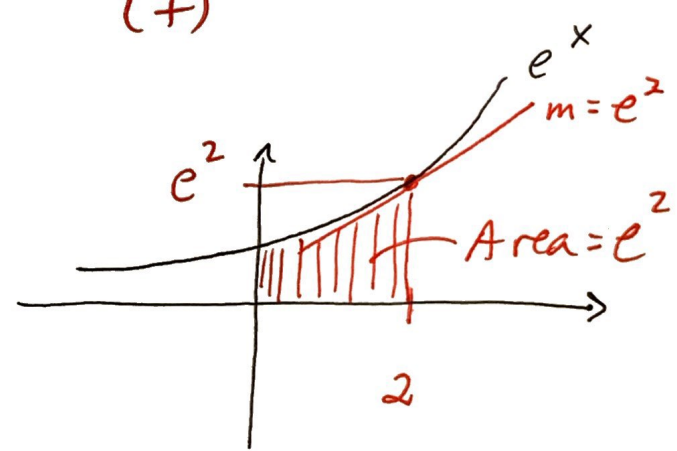
*Together



Natural Number: e

$$e \approx 2.719821982$$

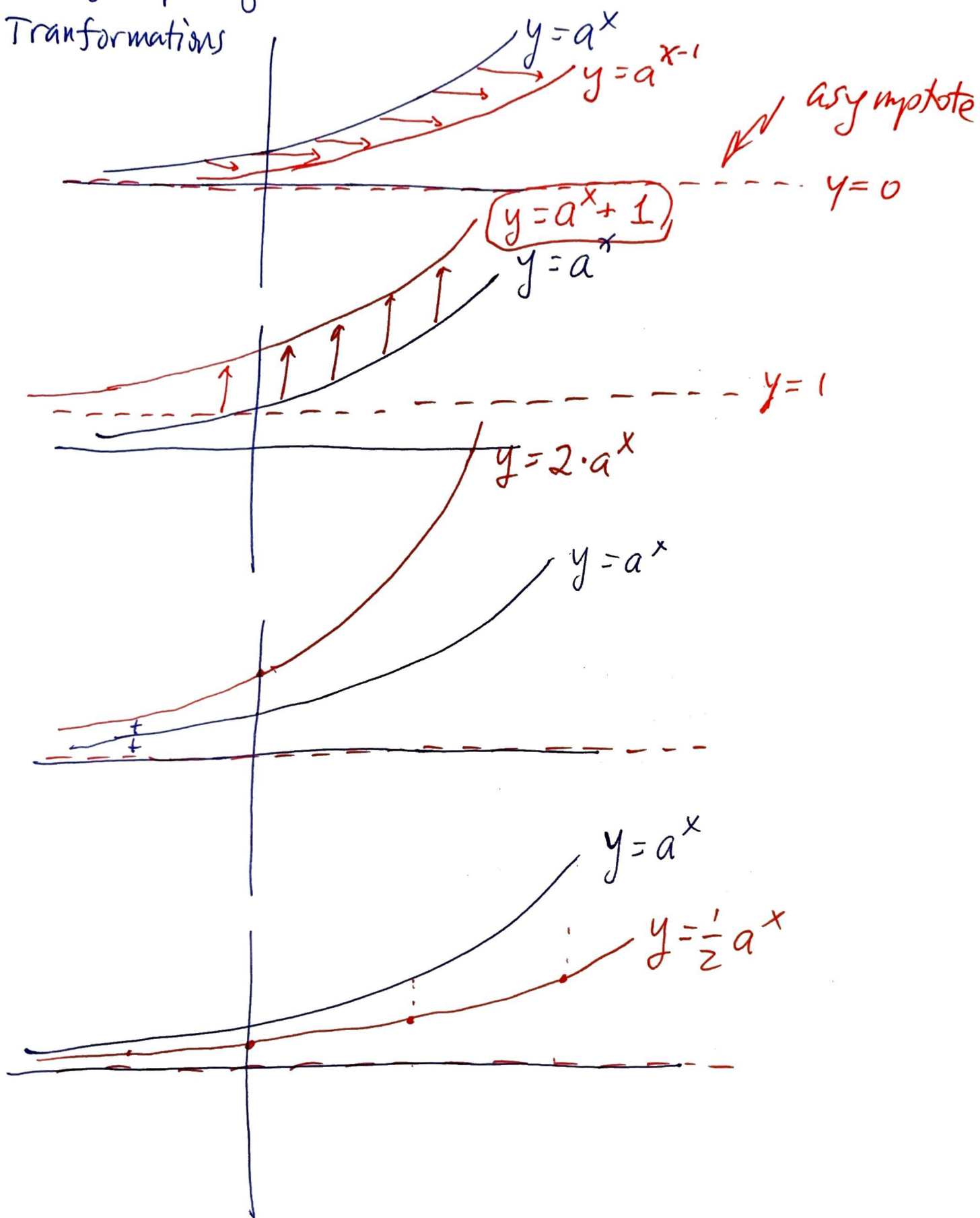
$$2 < e < 3$$



4.2 graphing (cont.)

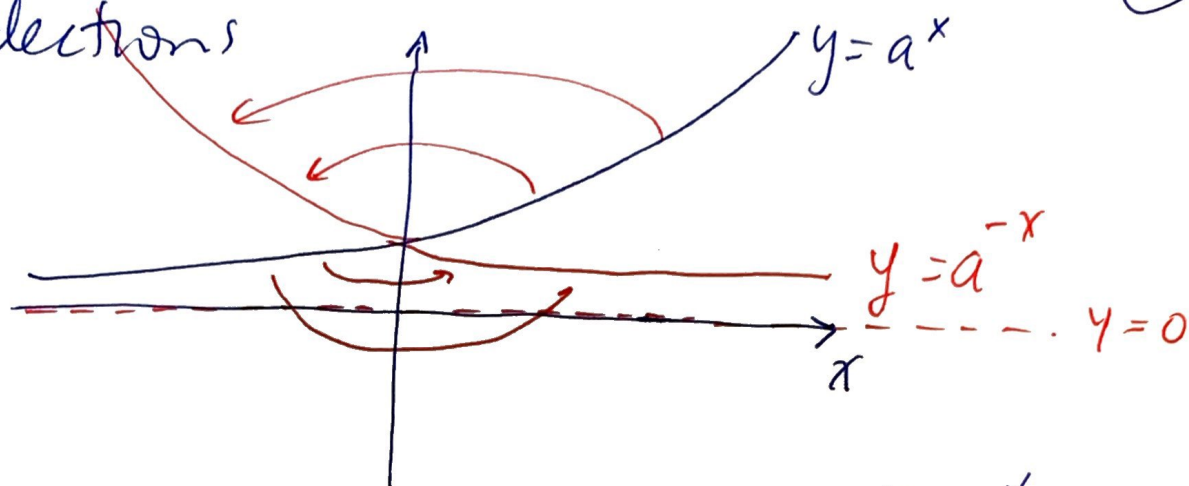
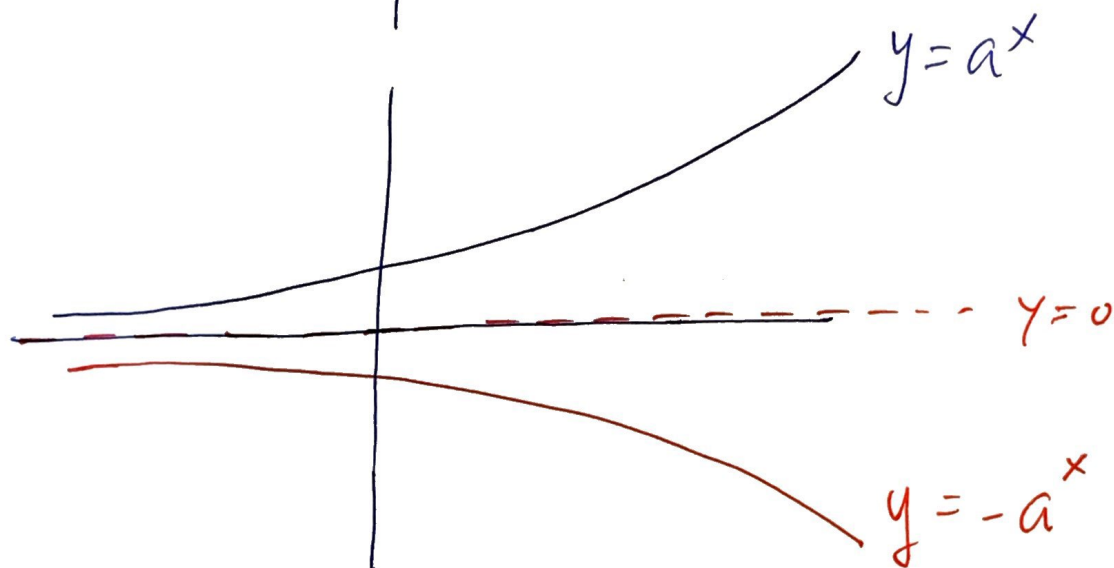
5

* Transformations

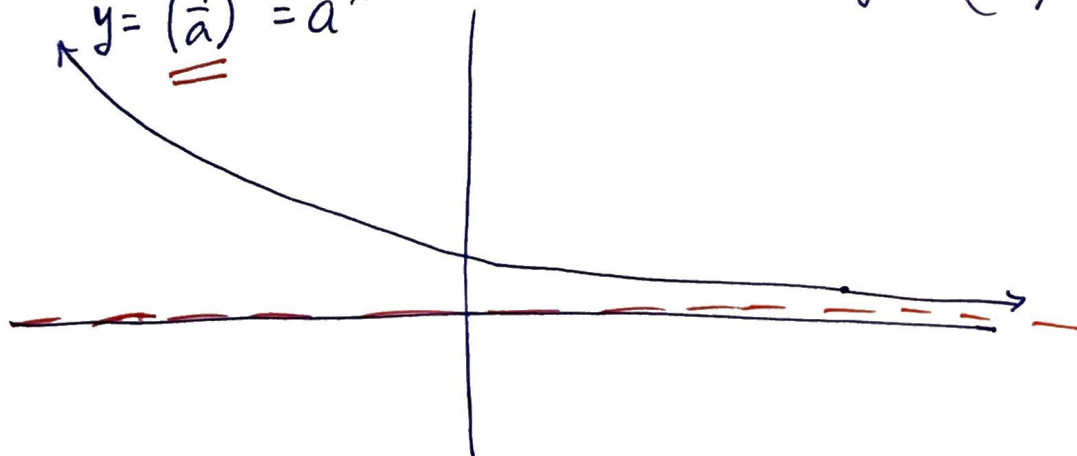


(6)

* reflections

reflect
across
y-axisreflect
across the
x-axis* back to $y = a^{-x}$ this can be written as $y = \frac{1}{a^x}$ or we can write it as $y = \left(\frac{1}{a}\right)^x$

$$y = \left(\frac{1}{a}\right)^x = a^{-x}$$



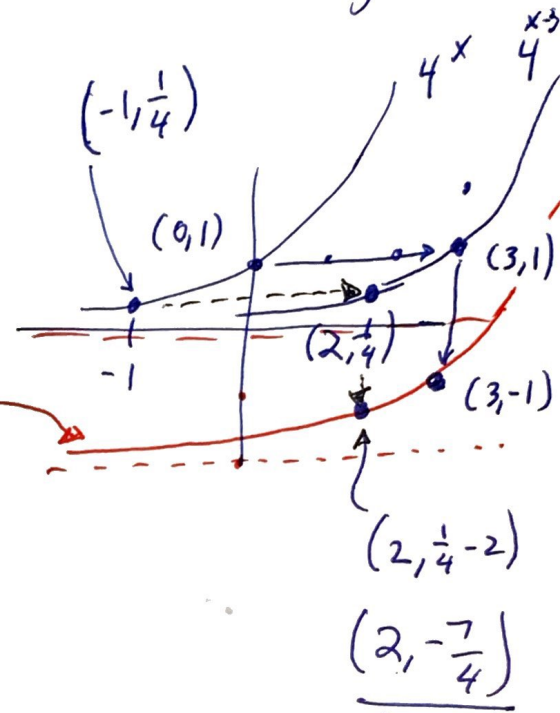
EX

What is the equation of $f(x) = 4^x$ after ⁷ we shift its graph 3 units to the right?

$$g(x) = 4^{x-3}$$

then drop its ^{graph} 2 units:

$$h(x) = 4^{x-3} - 2$$



EX

Write the equation of an exponential function whose graph is given by

