

Overspring break: (not required; highly strongly recommended)

odds p 357 #13-55

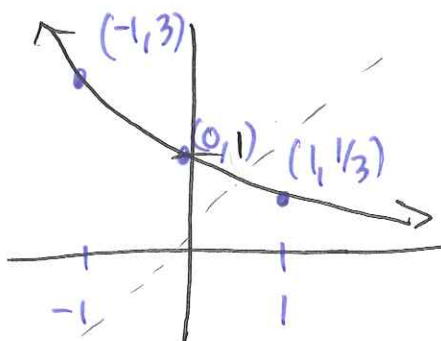
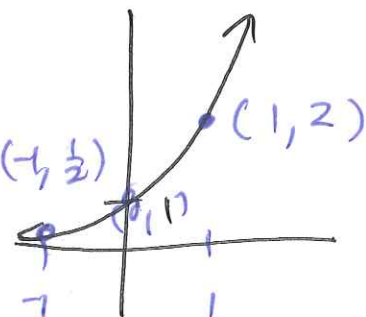
odds pg 366 #1-61

Next exam 3: March 31. (1.5 weeks after spring break!)

Next Alg exam #2: ~~April~~ April 11th.

$y = 2^x$

$y = (\frac{1}{3})^x$



input: exponent
output: number,
power of $2 / \frac{1}{3}$

one to one
⇒ inverse!

D: $(-\infty, \infty)$

D: $(-\infty, \infty)$

R: $(0, \infty)$

R: $(0, \infty)$

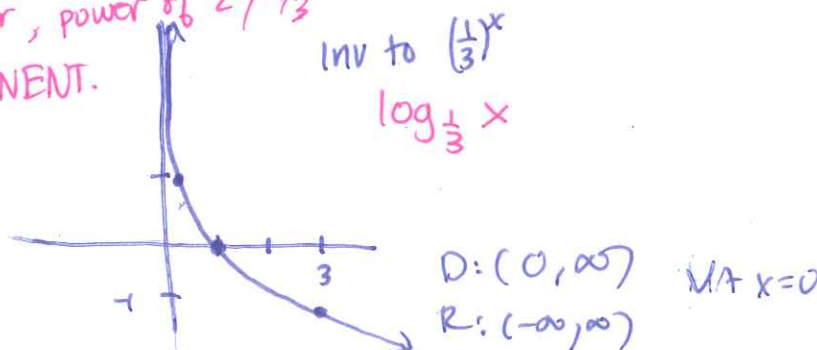
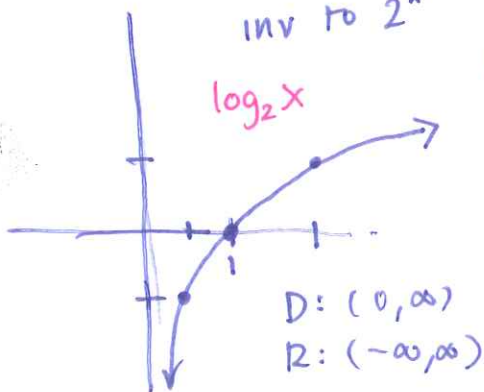
HA $y = 0$

HA $y = 0$

inv to 2^x
 $\log_2 x$

input: number, power of $2 / \frac{1}{3}$
output: EXPONENT.

inv to $(\frac{1}{3})^x$
 $\log_{\frac{1}{3}} x$



D: $(0, \infty)$
R: $(-\infty, \infty)$

VA $x = 0$

D: $(0, \infty)$
R: $(-\infty, \infty)$

VA $x = 0$

Example 1

Simplify/Evaluate: \swarrow college.

a) $\log_2 8 = \log_2 2^3 = 3$

(output of 2^x
 $2^x = 8$
 $x = 3$ high school)

b) $\log_4 2 = \log_4 \sqrt{4} = \log_4 4^{1/2} = 1/2$.

c) $\log_9 27 = \log_9 9 \cdot 3 = \log_9 9 \cdot \sqrt{9} = \log_9 9^{3/2} = 3/2$.

$$\log_b y = x$$

↑
"base"

means

$$y = b^x$$

↑
"base"

"equivalent equations"

4.3

Exponents:

Prop: 1.) $b^0 = 1$

2.) $b^1 = b$

B/c these are inverse

3.) $\log_b (b^x) = x$

4.) $b^{\log_b(x)} = x$

Logs:

exponent.
↓

1.) $\log_b 1 = 0$

2.) $\log_b b = 1$

Laws:

1.) $b^m b^n = b^{m+n}$

2.) $b^m / b^n = b^{m-n}$

3.) $(b^m)^n = b^{mn}$

1.) $\log_b(PQ) = \log_b(P) + \log_b(Q)$

2.) $\log_b(P/Q) = \log_b(P) - \log_b(Q)$

3.) $\log_b(P^n) = n \cdot \log_b(P)$

