Advanced Math

3-1
(Day 1)
Exponential Functions and Their Graphs

Exponential Function - the exponential function f with base a is
$$f(x) = a^x$$
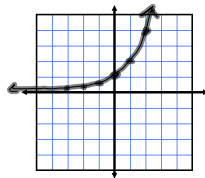where $a > 0$, and x is any real number.

Euler's Number - $e = 2.718281828\ldots$ nonrepeating, nonterminating

Natural Exponential Function - $f(x) = e^x$

Graph $f(x) = 2^x$

Domain: $\mathbb{R}$

Range: $(0, \infty)$

Asymptotes: $y = 0$

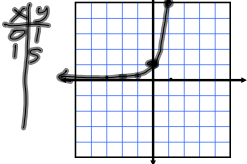| x	y
0	1
1	2
2	4
3	8
-1	$\frac{1}{2}$
-2	$\frac{1}{4}$
-3	$\frac{1}{8}$

Use properties of exponents to determine which functions (if any) are the same.
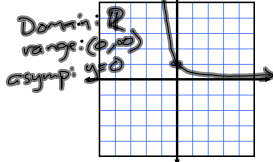
11) $f(x) = 3^{x-2}$

$g(x) = 3^x - 9 = 3^x - 3^2$

$h(x) = \frac{1}{9}(3^x) = 3^{-2}(3^x) = 3^{x-2}$

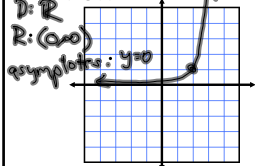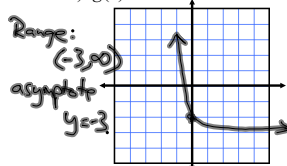Graph the exponential function. Label domain, range, asymptotes, mins, maxs.

19) $g(x) = 5^x$

x	y
0	1
1	5

21) $g(x) = 5^{-x}$

Domain: $\mathbb{R}$
range: $(0, \infty)$
asympt: $y = 0$

23) $g(x) = 5^{x-2}$

D: $\mathbb{R}$
R: $(0, \infty)$
asymptotes: $y = 0$
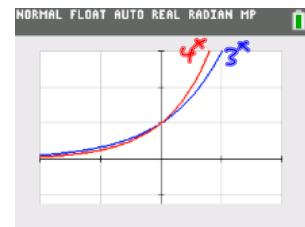
25) $g(x) = 5^{-x} - 3$

Range: $(-3, \infty)$
asymptote $y = -3$

Graph the functions $y = 3^x$ and $y = 4^x$ and use the graphs to solve the following inequalities:

a) $4^x > 3^x$
$x > 0$

b) $4^x < 3^x$
$x < 0$

NORMAL FLOAT AUTO REAL RADIAN MP

4^x 3^x

Assignment:
pg. 306
    2-14 even,
    15-18 all,
    20-38 even