

Always do the terminology fill-in-the-blank questions at the beginning of each homework section. This section, they are the first 8 questions.

Evaluate the following without a calculator. You will want to do a ton more of these, 'til you're *fast* at it.

9.  $3^3$

10.  $-9^{-\frac{3}{2}}$

Sleeper #15 that sneaked past me:  $\left(\frac{1}{2}\right)^{-4}$

Let  $f(x) = 3^x$ ,  $g(x) = 2^{1-x}$ , and  $h(x) = \left(\frac{1}{4}\right)^x$ . Evaluate the following:

11.  $f(-2)$

12.  $g(2)$

13.  $h(-1)$

Sketch the graph of each of the following functions.

14.  $f(x) = 5^x$

15.  $f(x) = \left(\frac{1}{4}\right)^x$

Use a graph or a table to find each limit. Down the road (Like, tomorrow!), you should have a general idea of what these objects look like and these limits at infinity will be quick-twitch 'end behavior' concepts for you.

16.  $\lim_{x \rightarrow \infty} (3^x)$

17.  $\lim_{x \rightarrow \infty} \left( \left( \frac{1}{3} \right)^x \right)$

Sketch the graph of each of the following exponential functions.

18.  $f(x) = 2^x - 3$

19.  $y = 1 - 2^x$

Write the equation defining the function described. I give you the transformations to a basic function. You provide the resulting function.

20. This function is obtained by shifting  $y = 2^x$  to the right 5 units and down 2 units.

21. This function is obtained by shifting  $y = \left(\frac{1}{4}\right)^x$  to the right 1 unit, reflected in the  $x$ -axis (vertical flip) and down 2 units.

Questions for in-class: #s 20 and 21 re-done for the following moves. *The order of the moves matters!!!*

a. reflect in  $x$ -axis, reflect in  $y$ -axis, up 3, left 7

b. up 3, left 7, reflect in  $x$ -axis, reflect in  $y$ -axis

c. reflect in  $x$ -axis and stretch vertically by factor of 3, reflect in  $y$ -axis and stretch horizontally by a factor of 5, up 3, right 7

d. up 3, right 7, reflect in  $x$ -axis and stretch vertically by factor of 3, reflect in  $y$ -axis and stretch horizontally by a factor of 5.

Solve each of the following equations. If you're using a calculator on these, you're probably not mastering the concepts the way I want. Sure, check answers with one. But manipulate these exponentials into a form that lends itself to solving by the  $a^x = a^y \Rightarrow x = y$  method. Trick is to get the same 'a' on both sides.

22.  $10^x = 0.1$

23.  $8^x = 2$

24.  $\left(\frac{1}{2}\right)^x = 8$

25. A deposit of  $P = \$4,000$  earns 8% annual percentage rate (APR). Find the amount,  $A$ , in the account and the interest earned,  $I$ , at the end of  $t = 6$  years, if interest is compounded...
- ... annually
  - ... quarterly
  - ... monthly
  - ... daily
  - ... continuously

If you're doing it right, daily and continuously shouldn't differ by much.

26. If the APR is 8%, compounded continuously on a principle balance of \$5,000, find the future value after...
- ... 6 years
  - ... 8 years
  - ... 5 years
  - ... 20 years, 321 days. (Assume 365 days in a year.)