

**MATH 90 REVIEW SHEET**  
**EXPONENTIAL AND LOGARITHMIC FUNCTIONS**

**INTRODUCTION:** Here we focus on on all aspects of exponential and logarithmic functions covered in our Math 90 class.

A) Rewrite each exponential function as a logarithmic function:

1)  $10^2 = 100$

2)  $2^x = 8$

3)  $3^x = 6$

4)  $w^c = b$

B) Rewrite each logarithmic function as an exponential function:

5)  $\log_3 81 = 4$

6)  $\log_2 32 = 5$

7)  $\log 1000 = 3$

8)  $\ln 6 = y$

C) Find the value of  $x$ :

5)  $\log_7 49 = x$

6)  $\log_2 x = 3$

7)  $\log_x 125 = 3$

8)  $\log_2 \frac{1}{16} = x$

D) Find the value of  $x$ :

9)  $8^x = 32$

10)  $3^{2x} = \frac{1}{9}$

11)  $125 = \left(\frac{1}{5}\right)^{x-4}$

12)  $27^{4x} = 9^{x-1}$

E) Use properties of logarithms to rewrite each expression as a single logarithm:

13)  $2 \log x - \log(x - 1)$

14)  $\log(x^2 + 3x - 1) + \log(2w) - 15 \log(z + 2)$

F) Use properties of logarithms to rewrite each expression in expanded form (if possible):

15)  $\log x^2$

16)  $\log \left( \frac{w^5}{2c} \right)$

17)  $\ln \left( \frac{(x)(x+1)}{7w^{10}} \right)$

18)  $\log(x + y)$

G) Solve the following exponential equations:

16)  $\log 2^x = 21$

17)  $3e^x - 1 = 17$

18)  $3^{x-1} = 2^{x+3}$

H) Solve the following logarithmic equations:

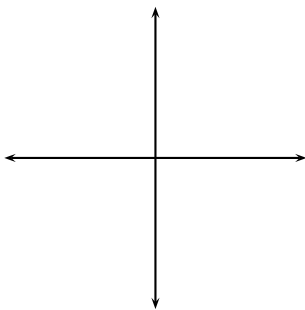
19)  $\log x + \log(x + 21) = 2$

20)  $\log(x + 1) - \log(x + 2) = \log \frac{1}{x}$

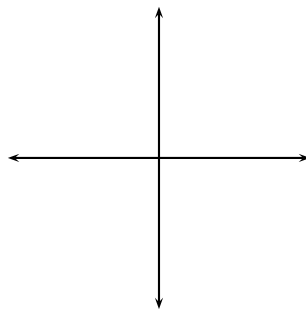
21)  $\ln(x + 2) = \ln(x - 4) + \ln 3$

I) **Sketch** the graph of each basic function on the axes given. **Label** the intercept using an ordered pair.

$f(x) = b^x$  where  $b > 1$



$f(x) = b^x$  where  $0 < b < 1$



$g(x) = \log_b x$

