

## Assignment : Exponential and Logarithm

**Rewrite each equation in exponential form.**

1)  $\log_{\frac{1}{2}} x = y$

2)  $\log_{18} x = y$

3)  $\log_y x = -17$

4)  $\log_{\frac{5}{4}} y = x$

**Rewrite each equation in logarithmic form.**

5)  $9^m = n$

6)  $x^y = 161$

7)  $x^y = 112$

8)  $11^x = 161$

**Find the inverse of each function.**

9)  $y = \log_5 (4x)$

10)  $y = \log_4 (x - 3)$

11)  $y = \log_2 x^5$

12)  $y = \log_x 3 + 2$

13)  $y = 10^x + 4$

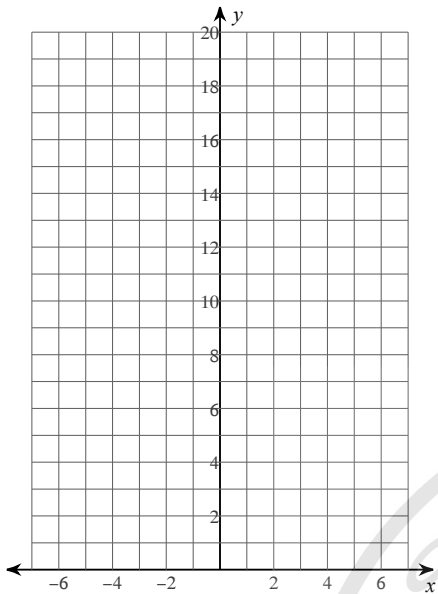
14)  $y = -\frac{e^x}{2}$

15)  $y = 3^x + 6$

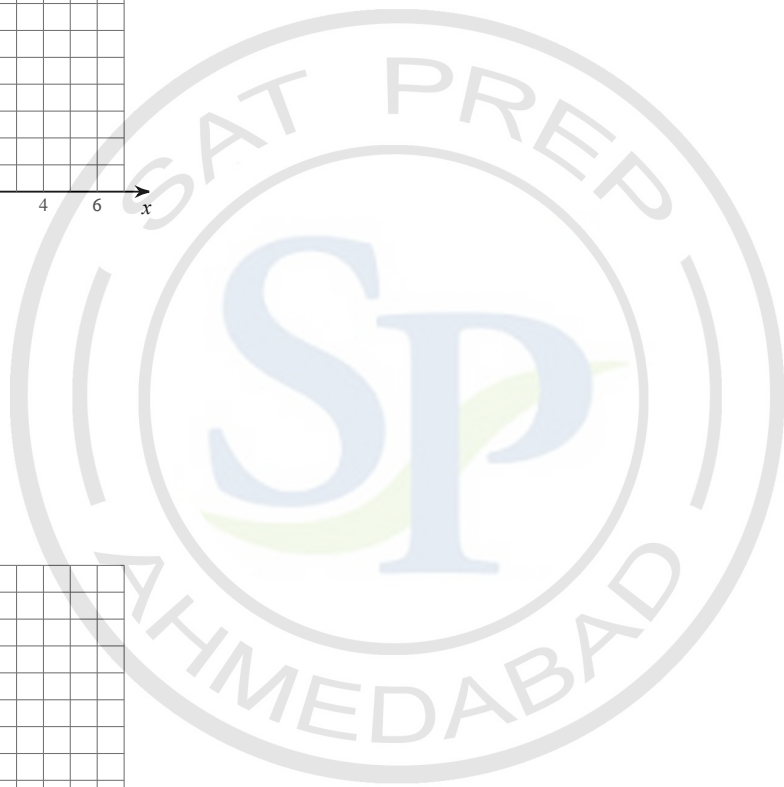
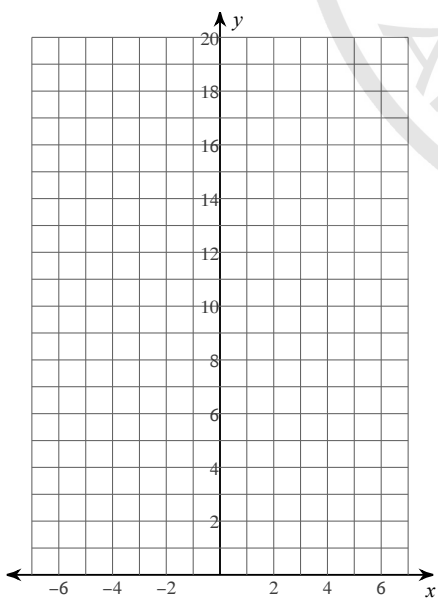
16)  $y = 3^x - 3$

For each function, determine the domain, range, intercepts, asymptotes, end behavior, and where the function is increasing or decreasing. Then sketch the graph.

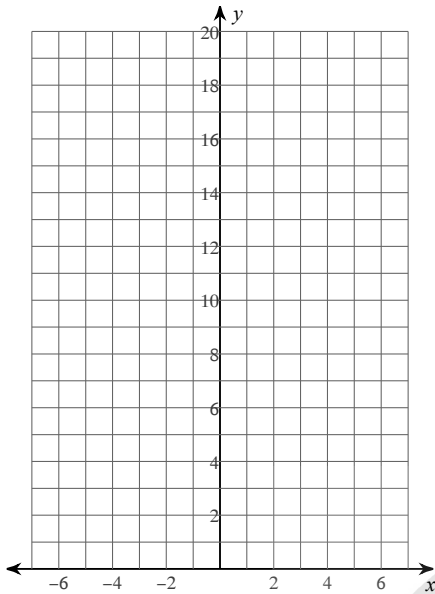
17)  $f(x) = \left(\frac{1}{4}\right)^x$



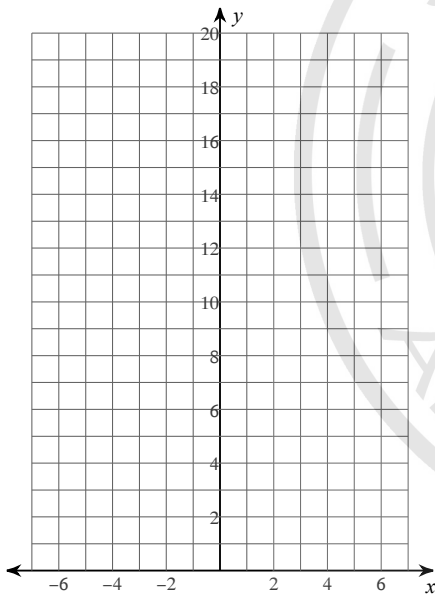
18)  $f(x) = 3^x$



$$19) f(x) = \left(\frac{1}{2}\right)^x$$



$$20) f(x) = 2^x$$



**Identify the domain and range of each.**

$$21) f(x) = \log_3 (x + 5) + 1$$

$$22) f(x) = \log_3 (x + 6) - 1$$

$$23) f(x) = \log_4 (x + 1) + 1$$

$$24) f(x) = \log (x - 1) - 4$$

**Solve each equation.**

$$25) \log_8 x + \log_8 (x + 2) = 1$$

$$26) \log 5x - \log 6 = \log 8$$

$$27) \log_3 2 + \log_3 2x^2 = 4$$

$$28) \log_6 (x - 4) - \log_6 x = 2$$

## Answers to Assignment : Exponential and Logarithm

1)  $\left(\frac{1}{2}\right)^y = x$

2)  $18^y = x$

3)  $y^{-17} = x$

4)  $\left(\frac{5}{4}\right)^x = y$

5)  $\log_9 n = m$

6)  $\log_x 161 = y$

7)  $\log_x 112 = y$

8)  $\log_{11} 161 = x$

9)  $y = \frac{5^x}{4}$

10)  $y = 4^x + 3$

11)  $y = 2^{\frac{x}{5}}$

12)  $y = 3^{\frac{1}{x-2}}$

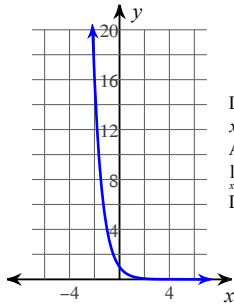
13)  $y = \log(x - 4)$

14)  $y = \ln -2x$

15)  $y = \log_3(x - 6)$

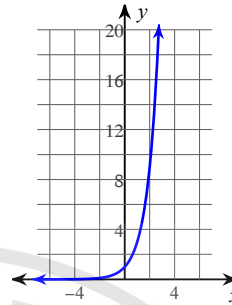
16)  $y = \log_3(x + 3)$

17)



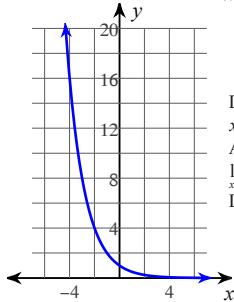
Domain:  $(-\infty, \infty)$  Range:  $(0, \infty)$   
 x-intercept: none y-intercept: 1  
 Asymptote:  $y = 0$   
 $\lim_{x \rightarrow \infty} f(x) = 0$   $\lim_{x \rightarrow -\infty} f(x) = \infty$   
 Decreasing on:  $(-\infty, \infty)$

18)



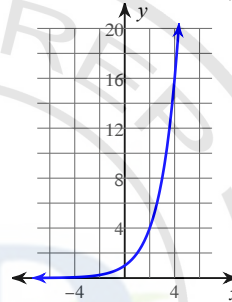
Domain:  $(-\infty, \infty)$  Range:  $(0, \infty)$   
 x-intercept: none y-intercept: 1  
 Asymptote:  $y = 0$   
 $\lim_{x \rightarrow -\infty} f(x) = 0$   $\lim_{x \rightarrow \infty} f(x) = \infty$   
 Increasing on:  $(-\infty, \infty)$

19)



Domain:  $(-\infty, \infty)$  Range:  $(0, \infty)$   
 x-intercept: none y-intercept: 1  
 Asymptote:  $y = 0$   
 $\lim_{x \rightarrow \infty} f(x) = 0$   $\lim_{x \rightarrow -\infty} f(x) = \infty$   
 Decreasing on:  $(-\infty, \infty)$

20)



Domain:  $(-\infty, \infty)$  Range:  $(0, \infty)$   
 x-intercept: none y-intercept: 1  
 Asymptote:  $y = 0$   
 $\lim_{x \rightarrow -\infty} f(x) = 0$   $\lim_{x \rightarrow \infty} f(x) = \infty$   
 Increasing on:  $(-\infty, \infty)$

21) Domain:  $x > -5$   
 Range: All reals

22) Domain:  $x > -6$   
 Range: All reals

23) Domain:  $x > -1$   
 Range: All reals

24) Domain:  $x > 1$   
 Range: All reals

25)  $\{2\}$

26)  $\left\{\frac{48}{5}\right\}$

27)  $\left\{\frac{9}{2}, -\frac{9}{2}\right\}$

28) No solution.