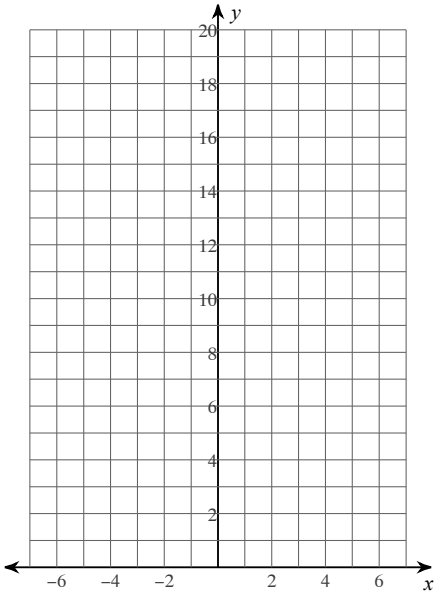
# Pre-Calculus - Expo & Logs Review

Session Date_____ Tutor Initials____

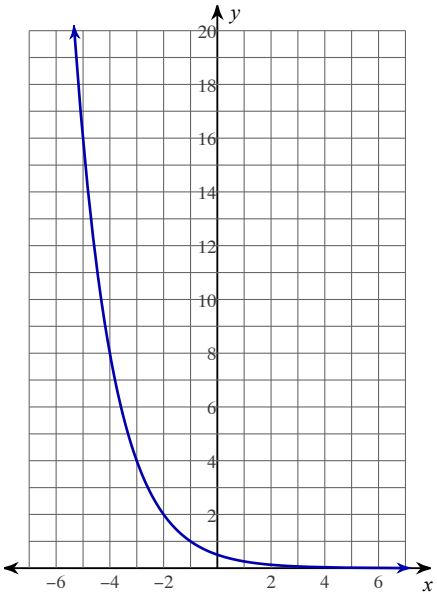
**For the following function, determine the domain, range, intercepts, asymptotes, end behavior, and where the function is increasing or decreasing. Then sketch the graph.**

1) $y = 4e^x$




**For the following graph, determine the domain, range, intercepts, asymptotes, end behavior, and where the function is increasing or decreasing. Then write the corresponding equation.**

2)




**Solve each equation.**

3) $6^{-x} = 6^{-x}$

4) $5^{2x} \cdot 5^2 = 5^{-3x-2}$

5) $4^2 \cdot 4^{2x-1} = \frac{1}{4}$

A) $\{-6\}$ B) $\{-1\}$

C) $\{5\}$ D) $\left\{-\frac{14}{9}\right\}$

6) $243^{-2k} \cdot \left(\frac{1}{27}\right)^{1-2k} = \frac{1}{243}$

A) $\left\{-\frac{3}{2}\right\}$

B) $\left\{\frac{1}{2}\right\}$

C) { All real numbers. }

D) $\{-4\}$

**Rewrite each equation in exponential form.**

7) $\log_{20} \frac{1}{400} = -2$

8) $\log_5 25 = 2$

**Rewrite each equation in logarithmic form.**

9) $x^y = 28$

10) $m^{-3} = n$

11) $\left(\frac{1}{17}\right)^2 = \frac{1}{289}$

12) $y^x = \frac{27}{127}$

**Evaluate each expression.**

13) $\log_4 \frac{1}{64}$

**Use a calculator to approximate the following expression to the nearest thousandth.**

14) $\log_4 3.2$

**Find the inverse of each function.**

15) $y = \log_6 (4x - 3)$

16) $y = -2\log_6 x - 7$

**Expand each logarithm.**

17) $\log (x \cdot y)$

18) $\log x^2$

19) $\log_4 \left(z^6 \sqrt[3]{x}\right)$

20) $\log_7 \left(\frac{a^2}{b}\right)^4$

**Condense each expression to a single logarithm.**

21) $\log_5 a + \log_5 b + \log_5 d + 5\log_5 c$

22) $\log_4 3 + \dfrac{\log_4 2}{3} + \dfrac{\log_4 5}{3} + \dfrac{\log_4 7}{3}$

**Use the properties of logarithms and the values below to find the logarithm indicated. Do not use a calculator to evaluate the logs.**

23) $\log_4 10 \approx 1.7$
$\log_4 9 \approx 1.6$
$\log_4 6 \approx 1.3$
Find $\log_4 900$

24) $\log_9 5 \approx 0.7$
$\log_9 8 \approx 0.9$
$\log_9 6 \approx 0.8$
Find $\log_9 \dfrac{81}{5}$

**Solve each equation.**

25) $4\log_2 (n+6) = 0$

26) $\log_{12} 2n - 2 = 2$

27) $\log_{16} (n^2 + 17) = \log_{16} (9n - 3)$

28) $\log_9 (-10x + 3) = \log_9 (x^2 + 12)$

29) $\log_7 (x+4) - \log_7 x = 2$

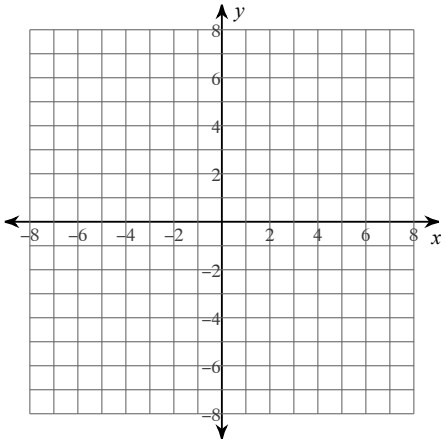
30) $\log_4 x - \log_4 (x+3) = 3$

31) $\ln 10 - \ln (2x+1) = 2$

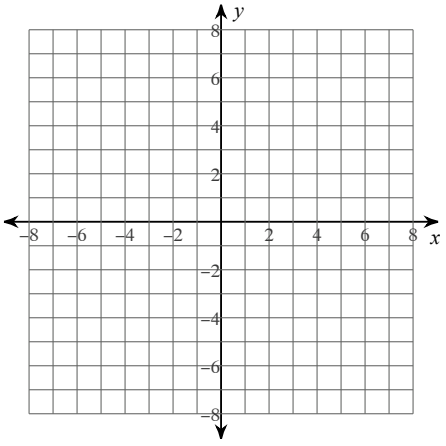
32) $\ln (3x^2 + 3) + \ln 3 = \ln 34$

**Sketch the graph of each function.**

33) $y = \log (x+2) - 5$

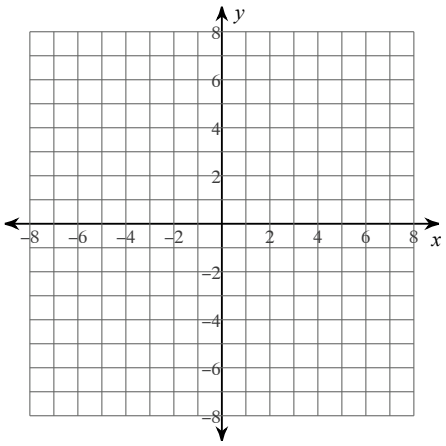



34) $y = \log (x-1) + 4$

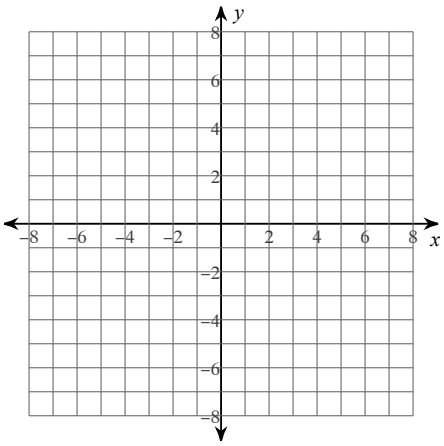


**Identify the domain and range of each. Then sketch the graph.**

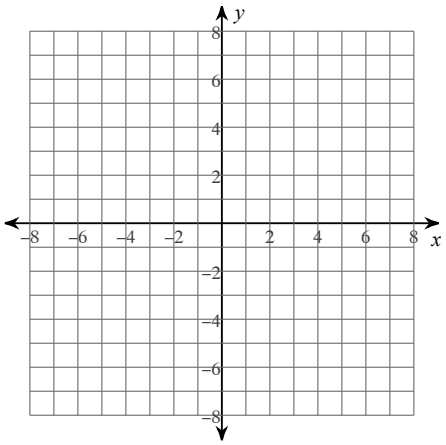
35) $y = \log_6 (x - 1) - 2$



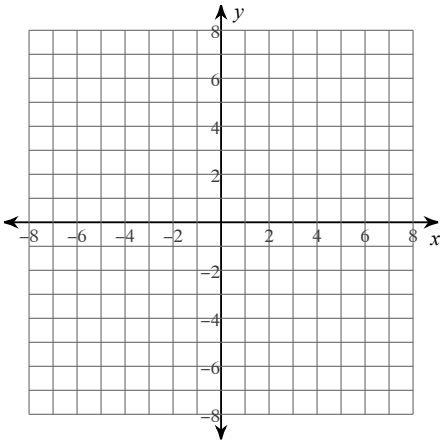

36) $y = \log_2 (x + 5) + 4$




37) $y = \log_4 (2x + 4) - 3$




38) $y = \log (4x - 10) - 4$




39) Jimmy invests $2,077 in a savings account with a fixed annual interest rate of 5% compounded 4 times per year. What will the account balance be after 9 years?

40) Jennifer invests $2,541 in a retirement account with a fixed annual interest rate of 4% compounded 4 times per year. What will the account balance be after 15 years?

41) Nicole invests $7,909 in a retirement account with a fixed annual interest rate of 2% compounded continuously. What will the account balance be after 20 years?

42) Paul invests $7,675 in a savings account with a fixed annual interest rate of 3% compounded continuously. What will the account balance be after 4 years?

43) Castel invests $7,577 in a retirement account with a fixed annual interest rate of 6% compounded continuously. How long will it take for the account balance to reach $23,691.52?

44) Jaidee invests $4,438 in a savings account with a fixed annual interest rate of 4% compounded continuously. How long will it take for the account balance to reach $5,420.59?