

Exponential & Logarithmic Functions

Review 1 – 5

Evaluate.

#1) $\frac{64^{\frac{5}{3}}}{64^4}$

Express using rational exponent.

#2) $\sqrt[5]{18x^3y^{15}}$

Express using radicals.

#3) $15x^{\frac{1}{3}}y^{\frac{1}{4}}$

Simplify.

#4) $(5ac)^{\frac{1}{5}}(a^{10}c^{15})^{\frac{1}{5}}$

Use a calculator to evaluate each expression to the nearest ten thousandth.

#5) $\left(\frac{2}{3}\right)^{\pi}$

Use a calculator to evaluate each expression to the nearest ten thousandth.

#6) $(5e)^{3.2}$

Use a calculator to find the antilogarithm of each number to the nearest hundredth.

#7) -1.3456

Use a calculator to find the common logarithm of each number to the nearest ten thousandth.

#8) 3.45

Write each equation in logarithmic form.

#9) $5^3 = 125$

Write each equation in exponential form.

#10) $\log_9 27 = \frac{3}{2}$

Evaluate the expression.

#11) $\log_2 64$

Evaluate the expression.

#12) $\log_7 \frac{1}{343}$

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Evaluate the expression.

#13) $\log_2 \frac{1}{16}$

Evaluate the expression.

#14) $13^{5 \log_{13} 2}$

Solve each equation.

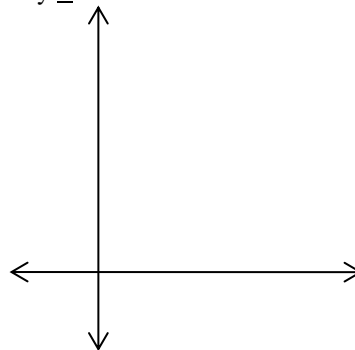
#15) $\log_6 2x + \log_6 10 = \log_6 74$

Solve each equation.

#16) $3 \log_7 5 + 4 \log_7 3 = \log_7 x$

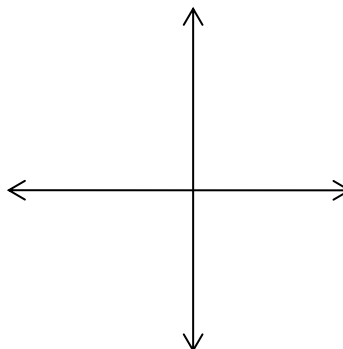
Graph each inequality using the parent graph.

#17) $y \leq 2^{x-4}$



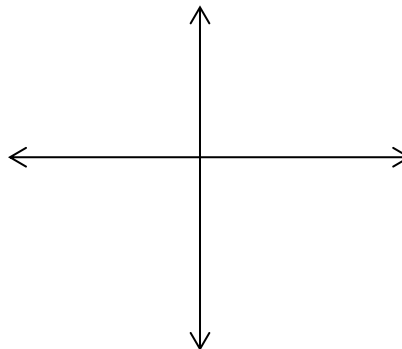
Graph each inequality using the parent graph.

#18) $y < \log_2 x$



Graph the equation. Then determine the interval in which each function is increasing or decreasing.

#19) $y = e^{2x}$



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#20) When Jim Bob started his first job after he finished college, he opened an individual retirement account (IRA). He plans to contribute \$2000 per year for 30 years until he retires. He hopes to earn an average APR of 8% over the 30-year period.

If Jim Bob contributes to his IRA at the rate that he plans, how much will his account be worth when he retires?

Given the original principal, the annual interest rate, the amount of time for each investment, and the type of compound interest, find the amount at the end of the investment.

#21) $P = \$2000$, $r = 6\%$, $t = 5$ years 6 months, continuously

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#22) If the population of 50 bacteria doubles every 5 minutes, how long will it take for the population to reach 12,800?

#23) The pH of a solution is a measure of its acidity. A low pH indicates an acidic solution, and a high pH indicates a basic solution. Neutral water has a pH of 7. The pH of a solution is related to the concentration of hydrogen ions it contains by the formula $pH = \log \frac{1}{H^+}$, where H^+ is the number of gram atoms of hydrogen ions per liter. If the pH of Mountain Dew is 6.2, what is the concentration of hydrogen ions?

- #1) 8
- #2) $18^{\frac{1}{5}} x^{\frac{3}{5}} y^3$
- #3) $15^2 \sqrt{x^4 y^3}$
- #4) $5^{\frac{1}{5}} a^{\frac{11}{5}} c^{\frac{16}{5}}$ or $a^2 c^3 \sqrt[5]{5ac}$
- #5) .2798
- #6) 4231.0324
- #7) .05
- #8) .5378
- #9) $\log_5 125 = 3$
- #10) $9^{\frac{3}{2}} = 27$
- #11) 6
- #12) -3
- #13) -4
- #14) 32
- #15) 3.7
- #16) 10,125
- #17) Check with calculator. Make sure you shade below and label your horizontal asymptote.
- #18) Check with calculator. Make sure you shade below, your curve should be dashed, and label your vertical asymptote.
- #19) increasing $(-\infty, \infty)$
- #20) \$226,566.42
- #21) \$2781.94
- #22) 40 minutes
- #23) $6.3 \cdot 10^{-7}$