Online Homework System

Assignment Worksheet
12/8/15 - 5:32 AM

Name: _____ **Class:** Post University - College Algebra (MAT 120.89 MOD2 (Humberd) 2015) (1qlis0a)

Class #: _____ **Section #:** _____

Instructor: Maple T.A. Administrator **Assignment:** Unit 8 Exam

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Question 1: (1 point)

Evaluate $\log_5 \sqrt[5]{\frac{1}{25}}$ without using a calculator.

If the answer is not an integer, enter it as a fraction in simplest form.

$\log_5 \sqrt[5]{\frac{1}{25}}$ = _____

Question 2: (1 point)

Evaluate $\log_2 4 + \log_2 2 - \log_2 64$ without using a calculator.

$\log_2 4 + \log_2 2 - \log_2 64 =$ _____

Question 3: (1 point)

Use the properties of logarithms to expand and simplify the expression.

$\log_2 \sqrt[6]{\frac{2+x}{32x}}$

(a) $\frac{1}{6}\log_2(2+x) - \frac{5}{6} + \frac{1}{6}\log_2 x$

(b) $\frac{1}{6}\log_2(2+x) - 5 - \log_2 x$

(c) $\frac{11}{6}\log_2(x) - 5 - \log_2 x$

(d) $\frac{1}{6}\log_2(2+x) - \frac{5}{6} - \frac{1}{6}\log_2 x$

Question 4: (1 point)

Use the properties of logarithms to expand and simplify the expression.

$\ln \sqrt[3]{\frac{5+x}{x^2}}$

(a) $\frac{1}{3}\ln(5+x) + \frac{2}{3}\ln x$

(b) $\frac{1}{3}\ln(5+x) - \frac{2}{3}\ln x$

(c) $\frac{1}{3}\ln(5) + \frac{1}{3}\ln x$

(d) $\frac{1}{3}\ln(5+x) - 2\ln x$

Question 5: (1 point)

Use the properties of logarithms to write the expression as a single logarithm, if possible.

$5\log_b 4x^4 - \frac{1}{2}\log_b(4x+9)$

(a) $\log_b\left(1{,}024x^{20}\sqrt{(4x+9)}\right)$

(b) $\log_b\left(\frac{4x^{20}}{\sqrt{(4x+9)}}\right)$

(c) $\log_b\left(1{,}024x^{20}(4x+9)^2\right)$

(d) $\log_b\left(\frac{1{,}024x^4}{\sqrt{(4x+9)}}\right)$

(e) $\log_b\left(\frac{1{,}024x^{20}}{\sqrt{(4x+9)}}\right)$

(f) The expression cannot be written as a single logarithm.

Question 6: (1 point)

Use the Change of Base Formula and common logs or natural logs to approximate the value of $\log_{16}\left(\frac{7}{8}\right)$ using a calculator.

If the answer is not an integer, enter it as a decimal rounded to the nearest hundredth, if needed.

$\log_{16}\left(\frac{7}{8}\right) =$ _____

Question 7: (1 point)

Solve.

$\frac{1}{243} = 81^{3t-6}$

$t =$ _____

Question 8: (1 point)

Solve.

$25^{x+4} = \left(\frac{1}{625}\right)^{1-x}$

$x =$ _____

Question 9: (1 point)

Solve.

$20 = 3(\frac{1}{8})^{x} - 1$

If the answer is not an integer, enter it as a decimal rounded to the nearest hundredth, if needed.

$x =$ _____

Question 10: (1 point)

Solve.

$5^{x} - 8^{5-x} = 0$

If the answer is not an integer, enter it as a decimal rounded to the nearest hundredth, if needed.

$x =$ _____

Question 11: (1 point)

Solve.

$$\frac{15+5e^{4-x}}{5}+3 = 12$$

If the answer is not an integer, enter it as a decimal rounded to the nearest hundredth, if needed.

$x =$ _____

Question 12: (1 point)

Solve.

$$9+11e^{8x-10} = 10$$

If the answer is not an integer, enter it as a decimal rounded to the nearest hundredth, if needed.

$x =$ _____

Question 13: (1 point)

Solve.

$$\ln(x+3)^7+10 = 38$$

If the answer is not an integer, enter it as a decimal. Round to the nearest hundredth, if needed.

$x \approx$ _____

Question 14: (1 point)

Solve.

$$-30 = 6-\log_3(4-x)^9$$

If the answer is not an integer, enter it as a decimal. Round to the nearest hundredth, if needed.

x = _____

Question 15: (1 point)

Use the Distance Modulus Formula, $M = 5 \log r - 5$ (where M is the distance modulus and r is the distance from Earth to a star in parsecs), and the fact that 1 parsec is approximately 3.3 light years, to find the distance in light years from Earth to a star with distance modulus 0.52.

If the answer is not an integer, enter it as a decimal rounded to the nearest hundredth, if needed.

_____light years

Question 16: (1 point)

A radioactive substance decays from 65 mg to 8.45 mg in 28 years according to the exponential decay model $y = ae^{-bx}$, where a is the initial amount and y is the amount remaining after x years.

Find the b -value.

Round to the nearest hundredth, if needed.

b =_____

Use the **EXACT** b-value to write the exponential decay model for this substance with initial amount 65 mg, then use that model to find the half-life.

Find the half-life.

Round to the nearest hundredth of a year, if needed.

half-life $\approx$ _____years

Question 17: (1 point)

An investor wants to analyze the earnings of a mutual fund account. Five years ago, the value of the account was $\$16,000$ and it is now worth $\$20,000$ (no additional deposits were made). If the account is compared to a bank account paying interest that is compounded continuously, what interest rate would the bank account have to pay to match the mutual fund accounts earnings?

Round the answer to the nearest hundredth of a percent.

Interest Rate $\approx$ _____%