Graded quiz on Tangent Lines to Functions, Exponents and Logarithms

Quiz, 13 questions

11/13 points (84%)

✔ Congratulations! You passed!

Next Item

✔ 1 / 1 points

1.
Convert $\frac{1}{49}$ to exponential form, using 7 as the factor.

- ○ 7^{-2}

Correct
The rule for a factor to a Negative exponent is to divide by the same factor to a positive exponent with the same absolute value.

- ○ (7^2)
- ○ 49^{-1}
- ○ $\frac{7}{7^3}$

✖ 0 / 1 points

2.
A light-year (the distance light travels in a vacuum in one year) is $9,460$ trillion meters. Express in scientific notation.

- ○ 0.946×10^{16}
- ○ 9.46×10^{15} kilometers

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- 9460×10^{12} meters.

This should not be selected

$9,460$ is (9.4×10^3) meters and one trillion meters is 10^{12} meters. $(9.4 \times 10^3)(10^{12}) = 9.4 \times 10^{15}$. A kilometer is 1000 meters.

- 9.46×10^{15} meters.

✔ 1 / 1 points

3.
Simplify $(x^8)(y^3)(x^{-10})(y^{-2})$

- $(x^2)(y)$
- $(x)(y^{-2})$
- $(x^{-2})(y)$

Correct

By the Division and Negative Powers Rule, this is $(x^{(8-10)})(y^{(3-2)})$

- $(x^{-80})(y^{-6})$

✔ 1 / 1 points

4.
Simplify $[(x^4)(y^{-6})]^{-1}$

- $(x^{-4})(y^6)$

Correct

By the Power to a Power Rule, each of the exponents is multiplied by (-1)

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$\frac{(x^{-4})}{(y^{6})}$

$(x^3)(y^{-7})$

$\frac{(x^4)}{(y^{-6})}$

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1 / 1 points

5.
Solve for x:

$$\log_2(39x) - \log_2(x-5) = 4$$

$\frac{-80}{23}$

Correct

$\log_2 \frac{39x}{(x-5)} = 4$ by the Quotient Rule.

Since both sides are equal, we can use them as exponents in an equation.

$$2^{\log_2 \frac{39x}{(x-5)}} = 2^4$$

$$\frac{39x}{(x-5)} = 16$$

$$39x = 16 \times (x-5)$$

$$39x = 16x - 80$$

$$23x = -80$$

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$\frac{-80}{23}$

$\frac{80}{38}$

$\frac{39}{23}$

$\frac{23}{80}$

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1 / 1 points

6.

Simplify this expression:

$$\left(x^{\frac{1}{2}}\right)^{\frac{-3}{2}}$$

x^{-1}

$x^{\frac{-3}{4}}$

Correct

We use the Power to a Power Rule -- multiply exponents:

$$x^{\frac{1}{2}\times\frac{-3}{2}} = x^{\frac{-3}{4}}$$

$x^{\frac{4}{3}}$

$x^{\frac{1}{3}}$

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1 / 1 points

7.

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Simplify $\log_{10} 1000 + \log_{10} \frac{1}{10000}$

- -1

Correct

By the Product Rule, this is:

$$\log_{10}(\frac{1000}{10000}) = \log_{10}(\frac{1}{10}) = -1$$

- 1
- $\log_{10} -10$
- $\frac{1}{10}$

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1 / 1 points

8.

If $\log_3 19 = 2.608$, what is $\log_9 19$?

- 0.4347
- 5.216
- 1.304

Correct

To convert from $\log_3$ to $\log_9$, divide by $\log_3 9$. Which is equal to 2, so the answer is 1.304

- 0.8934

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1 / 1 point

9.

If $\log_{10} b = 1.8$ and $log_a b = 2.5752$, what is a?

- 6
- 3
- 5

Correct

To solve for a in the formula;

$$\log_a b = \frac{\log_x b}{\log_x a}$$

$\log_a b = 2.5752$ and $\log_{10} b = 1.8$

Therefore, $\log_{10} a$ must equal to

$$\frac{1.8}{2.5752} = 0.69897$$

Treating both sides of equation $\log_{10} a = 0.69897$ as exponents of 10 gives $a = 10^{0.69897} = 5$

- 4

0 / 1 points

10.

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An investment of $1,600$ is worth $7,400$ after 8.5 years. What is the continuously compounded rate of return of this investment?

- 18.01%
- 17.01%
- 19.01%
- 20.01

This should not be selected

$$\frac{\ln \frac{7400}{1600}}{8.5} =$$

Double check your math and see if that yields the correct answer!

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1 / 1 points

11.

A pearl grows in an oyster at a continuously compounded rate of $.24$ per year. If a 25-year old pearl weighs 1 gram, what did it weigh when it began to form?

- 0.0002478
- 0.002478

Correct

$$e^{(0.24 \times 25)} = \frac{1}{x}$$

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$$x = \frac{1}{\left(e^{0.24 \times 25}\right)}$$

$$x = \frac{1}{403.4288}$$

$$x = 0.002478$$

- 0.2478
- 0.02478

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1 / 1 points

12.
$\log_2 z = 6.754$ What is $\log_{10}(z)$?

- 2.03316

Correct

$$\frac{\log_2 z}{\log_2 10} =$$

$$(\log_{10} z) \times (\log_2 10) = 3.321928$$

Therefore, $\log_{10} z = \frac{6.754}{3.321928} = 2.03316$

- 0.49185
- 0.82956
- 1.3508

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13. 1/1 points

Suppose that $g : \mathbb{R} \to \mathbb{R}$ is a function, and that $g(1) = 10$. Suppose that $g'(a)$ is negative for every single value of a.Which of the following could possibly be $g(1.5)$?

- $g(1.5) = 11$
- $g(1.5) = 103.4$
- $g(1.5) = 9.7$

Correct

Since the slope of the tangent line to the graph of g is negative everywhere on the graph, we know that g is *decreasing* function! And therefore we must have $g(1.5) < g(1)$. That is the case here, so this value is at least possible.

- $g(1.5) = 10.1$