

WEEK 3

- Fast Growth, Slow Growth - Graded quiz on Tangent Lines to Functions, Exponents and Logarithms (13 questions)

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Graded quiz on Tangent Lines to Functions, Exponents and Logarithms

Teste valendo nota • 45 min

Vencimento Jun 13, 1

✓ **Parabéns! Você foi aprovado!**

PARA SER APROVADO 75% ou superior

Continue aprendendo

NOTA
92,30%

Graded quiz on Tangent Lines to Functions, Exponents and Logarithms

NOTA DO ENVIO MAIS RECENTE

92.3%

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

1 / 1 ponto

☐ $\frac{7}{7^3}$

☐ 49^{-1}

☐ (7^2)

☒ 7^{-2}

✓ **Correto**

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.

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

1 / 1 ponto

☐ 9.46×10^{15} kilometers

☒ 9.46×10^{15} meters.

☐ 0.946×10^{16}

☐ 9460×10^{12} meters

✓ **Correto**

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.

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

1 / 1 ponto

☐ $(x^{-80})(y^{-6})$

☐ $(x^2)(y)$

☐ $(x)(y^{-2})$

☒ $(x^{-2})(y)$

✓ **Correto**

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

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

1 / 1 ponto

☒ $(x^{-4})(y^6)$

☐ $\frac{(x^4)}{(y^{-6})}$

☐ $\frac{(x^{-4})}{(y^6)}$

☐ $(x^3)(y^{-7})$

✓ **Correto**

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

5. Solve for x :

1 / 1 ponto

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

- ☐ $\frac{80}{38}$
- ☐ $\frac{23}{80}$
- ☐ $\frac{39}{23}$
- ☒ $\frac{-80}{23}$

✓ Correto

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

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

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

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

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

$$39x = 16x - 80$$

$$23x = -80$$

$$x = \frac{-80}{23}$$

6. Simplify this expression:

1 / 1 ponto

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

☒ $x^{\frac{-3}{4}}$

☐ $x^{\frac{1}{3}}$

☐ $x^{\frac{4}{3}}$

☐ x^{-1}

✓ Correto

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

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

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

1 / 1 ponto

☐ 1

☐ $\frac{1}{10}$

☒ -1

☐ $\log_{10} -10$

✓ Correto

By the Product Rule, this is:

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

8. If $\log_3 19 = 2.680$, what is $\log_9 19$?

0 / 1 ponto

- ☐ 5.216
- ☐ 0.4347
- ☒ 0.8934
- ☐ 1.304

✗ Incorreto

To convert from \log_3 to \log_9 , divide by $\log_3 9$, which is equal to 2.

Try again! You can do this!

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

1 / 1 ponto

- ☐ 3
- ☒ 5
- ☐ 6
- ☐ 4

✓ Correto

To solve for a in the formula;

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

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

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 $a = 10^{0.69897} = 5$

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

1 / 1 ponto

- ☐ 17.01%
- ☒ 18.02%
- ☐ 20.01
- ☐ 19.01%

✓ Correto

$$\frac{\ln \frac{7400}{1600}}{8.5} = 0.18017$$

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?

1 / 1 ponto

- ☐ 0.2478
- ☒ 0.002478
- ☐ 0.0002478
- ☐ 0.02478

✓ Correto

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

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

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

$$x = 0.002478$$

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

1 / 1 ponto

☐ 0.49185

☒ 2.03316

☐ 0.82956

☐ 1.3508

✓ Correto

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

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

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

13. Suppose that $g : \mathbb{R} \rightarrow \mathbb{R}$ 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 $g(1.5)$?

1 / 1 ponto

- ☐ $g(1.5) = 103.4$
- ☐ $g(1.5) = 10.1$
- ☐ $g(1.5) = 11$
- ☒ $g(1.5) = 9.7$

✓ **Correto**

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.