✓ **Félicitations ! Vous avez réussi !**
POUR RÉUSSIR 75 % ou plus

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NOTE
100 %

Graded quiz on Tangent Lines to Functions, Exponents and Logarithms

NOTE DE LA SOUMISSION LA PLUS RÉCENTE
100%

1. Convert \begin {align}\frac{1}{49}\end {align} to exponential form, using 7 as the factor. **1 / 1 point**

- ○ \begin {align} {\large \frac{7}{7^3}}\end {align}
- ○ (7^2)
- ◉ 7^{-2}
- ○ 49^{-1}

✓ **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.

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 point**

- ○ 0.946×10^{16}
- ○ 9460×10^{12} meters
- ○ 9.46×10^{15} kilometers
- ◉ 9.46×10^{15} meters.

✓ **Correct**
$9,460$ 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 point**

- ○ $(x^2)(y)$
- ◉ $(x^{-2})(y)$
- ○ $(x^{-80})(y^{-6})$
- ○ $(x)(y^{-2})$

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

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

- ◉ $(x^{-4})(y^6)$
- ○ {\large \begin {align}\frac{(x^4)}{(y^{-6})}\end {align}}
- ○ $(x^3)(y^{-7})$
- ○ {\large \begin {align} \frac{(x^-{4})}{(y^6)}\end {align}}

✓ Correct

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

5. Solve for x: 1 / 1 point

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

- \begin {align}\frac{80}{38}\end {align}
- \begin {align}\frac{23}{80}\end {align}
- \begin {align}\frac{-80}{23}\end {align}
- \begin {align}\frac{39}{23}\end {align}

✓ Correct

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

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

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

\begin {align}\frac{39x}{(x-5)}=16\end {align}

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

$39x = 16x - 80$

$23x = -80$

x=\begin {align}\frac{-80}{23}\end {align}

6. Simplify this expression: 1 / 1 point

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

- $x^{\frac{1}{3}}$
- $x^{\frac{4}{3}}$
- $x^{\frac{-3}{4}}$
- x^{-1}

✓ Correct

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

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

7. Simplify $\log_2 8 - \log_2 4 - (\log_3 4.5 + \log_3 2)$ 1 / 1 point

- -1
- 1
- 0
- 2

Correct

This is equivalent to:

$\log_2(\frac{8}{4}) - \log_3(4.5 \times 2) = 1 - 2 = -1$

8. If $\log_3 19 = 2.680$, what is $\log_9 19$? 1 / 1 point

- 5.216
- 0.8934
- 1.304
- 0.4347

Correct

To convert from $\log_3$ to $\log_9$, divide by $\log_3 9$. Which is equal to 2, so the answer is 1.34

9. If $\log_{10} b = 1.8$ and $log_a b = 2.5752$, what is a? 1 / 1 point

- 5
- 3
- 4
- 6

Correct

To solve for a in the formula;

\log_a b=\begin {align}\frac{\log_x b}{\log_x a}\end {align}

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

Therefore, $\log_{10} a$ must equal to \begin {align} \frac{1.8}{2.5752}=0.69897\end {align}
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 point

- 19.01%
- 20.01
- 18.02%
- 17.01%

Correct

\begin {align} \frac{\ln{\frac{7400}{1600}}}{8.5}=0.18017\end {align}

11. A pearl grows in an oyster at a continuously compounded rate of 24 per 1 / 1 point

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 point

- 0.02478
- 0.0002478
- 0.2478
- ◉ 0.002478

✓ Correct

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

{\large x=\begin {align} \frac{1}{(e^{0.24 \times 25})} \end {align}}

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

$x = 0.002478$

12. $\log_2 z = 6.754$. What is $\log_{10}(z)$? 1 / 1 point

- 1.3508
- 0.82956
- ◉ 2.03316
- 0.49185

✓ Correct

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

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

Therefore, \log_{10} z=\begin {align}\frac{6.754}{3.321928}=2.03316\end {align}

13. 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 $g(1.5)$? 1 / 1 point

- $g(1.5) = 103.4$
- ◉ $g(1.5) = 9.7$
- $g(1.5) = 11$
- $g(1.5) = 10.1$

✓ 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.