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Graded quiz on Tangent Lines to Functions, Exponents and Logarithms

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

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

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

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

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

4. **Simplify** $[(x^4)(y^{-6})]^{-1}$ — 0 / 1 point

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

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

5. Solve for x: — 1 / 1 point

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

- ○ $\frac{80}{38}$
- ○ $\frac{39}{23}$
- ○ $\frac{23}{80}$
- ◉ $\frac{-80}{23}$

✓ Correct

4. **Simplify** $[(x^4)(y^{-6})]^{-1}$ — 0 / 1 point

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

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

5. Solve for x: — 1 / 1 point

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

- ○ $\frac{80}{38}$
- ○ $\frac{39}{23}$
- ○ $\frac{23}{80}$
- ◉ $\frac{-80}{23}$

✓ Correct

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

- 5.216
- 0.4347
- 0.8934
- 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 1.34

9. If $\log_{10} b = 1.8$ and $log_a b = 2.5752$, what is a? 0 / 1 point

- 4
- 6
- 3
- 5

Incorrect

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

- 17.01%
- 19.01%
- 20.01
- 18.02%

Correct

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

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 point

- 0.0002478
- 0.02478
- 0.002478
- 0.2478

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

- (•) 2.03316
- ( ) 0.82956
- ( ) 1.3508
- ( ) 0.49185

✓ Correct

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

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

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

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 $g(1.5)$? 0 / 1 point

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