Your grade: 100%

Your latest: **100%** • Your highest: **100%** • To pass you need at least 75%. We keep your highest score.

Next item →

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

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

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.** $(9.4 \times 10^3)(10^{12})$ **=** 9.4×10^{15}**. A kilometer is** 1000 **meters.**

3. Simplify $(x^8)(y^3)(x^{-10})(y^{-2})$ 1 / 1 point

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

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

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

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

5. Solve for x: 1 / 1 point

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

- (●) $\frac{-80}{23}$
- ( ) $\frac{80}{38}$
- ( ) $\frac{23}{80}$
- ( ) $\frac{39}{23}$

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.

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

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

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

$$39x = 16x - 80$$

$$23x = -80$$

$23x = -80$

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

6. Simplify this expression: 1 / 1 point

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

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

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

- 2
- -1
- 0
- 1

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

- 0.4347
- 1.304
- 0.8934
- 5.216

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

- 4
- 3
- 6
- 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** $a = 10^{0.69897} = 5$

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

- 18.02%
- 20.01
- 17.01%
- 19.01%

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

- 0.02478
- 0.0002478
- 0.2478
- 0.002478

Correct

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

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

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

$x = 0.002478$

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

- 0.82956
- 0.49185
- 1.3508
- 2.03316

Correct

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

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

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

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

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

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.