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Practice quiz on Exponents and Logarithms

PUNTOS TOTALES DE 12

1. Re write the number $784 = 2 \times 2 \times 2 \times 2 \times 7 \times 7$ using exponents. 1 / 1 punto

- $(16^4)(49^2)$
- $(2^4)(7^2)$
- $(2 \times 7)^6$
- $(2^6)(7^6)$

Correcto

For this type of problem, count the number of times each relevant factor appears in the product. That number is the exponent for that factor.

2. What is $(x^2 - 5)^0$? 1 / 1 punto

- -4
- (x^2)
- 1
- $(x^2) - 5$

Correcto

Any real number (except zero) raised to the"zeroith" power $= 1$.

3. Simplify $((x - 5)^2)^{-3}$ 1 / 1 punto

- $(x - 5)^{-5}$
- $(x - 5)^{-6}$
- $(x - 5)$
- $(x - 5)^{-1}$

Correcto

By Rule 2, "Power to a Power," multiply the exponents and get:

$$(x - 5)^{(2 \times -3)} = (x - 5)^{-6}$$

4. Simplify $(\frac{8^2}{8^7})^2$ 1 / 1 punto

- (●) 8^{-10}
- ( ) 8^{-1}
- ( ) 8^{-4}
- ( ) 8^{-5}

✓ **Correcto**

We can first simplify what is inside the parenthesis to 8^{-5} using the Division and Negative Powers Rule.

Then apply division and negative powers-- the result is the same. $\frac{8^4}{8^{14}} = 8^{-10}$

5. $\log 35 = \log 7 + \log x$ 1 / 1 punto

Solve for x

- (●) 5
- ( ) 28
- ( ) 4
- ( ) 7

✓ **Correcto**

$\log(x) = \log 35 - \log 7$

$\log(x) = \log(\frac{35}{7})$

By the Quotient Rule $\log x = \log 5$

6. $\log_2(x^2 + 5x + 7) = 0$ 1 / 1 punto

Solve for x

- ( ) $x = 2$
- ( ) $x = 3$
- ( ) $x = 2$ or $x = 3$

7. Simplify $\log_2 72 - \log_2 9$ **1 / 1 punto**

- $\log_2 63$
- $\log_2 4$
- (•) 3
- 4

✓ **Correcto**

By the quotient rule, this is $\log_2 \frac{72}{9} = \log_2 2^3 = 3$

8. Simplify $\log_3 9 - \log_3 3 + \log_3 5$ **1 / 1 punto**

- 15
- $\log_3 8$
- (•) $\log_3 15$
- 8

✓ **Correcto**

By the Quotient and Product Rules, this is $\log_3 \frac{9 \times 5}{3} = \log_3 15$

9. Simplify $\log_2(3^8 \times 5^7)$ **1 / 1 punto**

- $56 \times \log_2 15$
- (•) $(8 \times \log_2 3) + (7 \times \log_2 5)$
- $(5 \times \log_2 3) + (8 \times \log_2 5)$
- $15 \times \log_2 56$

✓ **Correcto**

We first apply the Product Rule to convert to the sum: $\log_2(3^8) + \log_2(5^7)$. Then apply the power and root rule.

10. If $\log_{10} y = 100$, what is $\log_2 y =$? 1 / 1 punto

- 20
- 332.19
- 500
- 301.03

✓ Correcto

Use the change of base formula, $\log_a b = \frac{\log_x b}{\log_x a}$

Where the "old" base is x and the "new" base is a.

So $\frac{100}{\log_{10}(2)} = \frac{100}{0.30103} = 332.19$

11. A tree is growing taller at a continuous rate. In the past 12 years it has grown from 3 meters to 15 meters. What is its rate of growth per year? 1 / 1 punto

- 11.41%
- 13.41%
- 12.41%
- 10.41%

✓ Correcto

$$\frac{\ln \frac{15}{3}}{12} = 0.1341$$

12. Bacteria can reproduce exponentially if not constrained. Assume a colony grows at a continually compounded rate of 400% per day. How many days before a colony with initial mass of 6.25×10^{-10} grams weights 1000 Kilograms? 1 / 1 punto

- 8.75 days
- 0.875 days
- 87.5 days
- 875 days

✓ Correcto

$6.25 \times 10^{-10} \times e^{4t} = 10^6$